United States Department of Agriculture

Soil Conservation Service

Phoenix Arizona

Arizona
Water Supply Outlook
January 1, 1986

57 96

Foreward

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 98502; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Arizona
Water Supply Outlook

and

Federal-State-Private
Cooperative Snow Surveys

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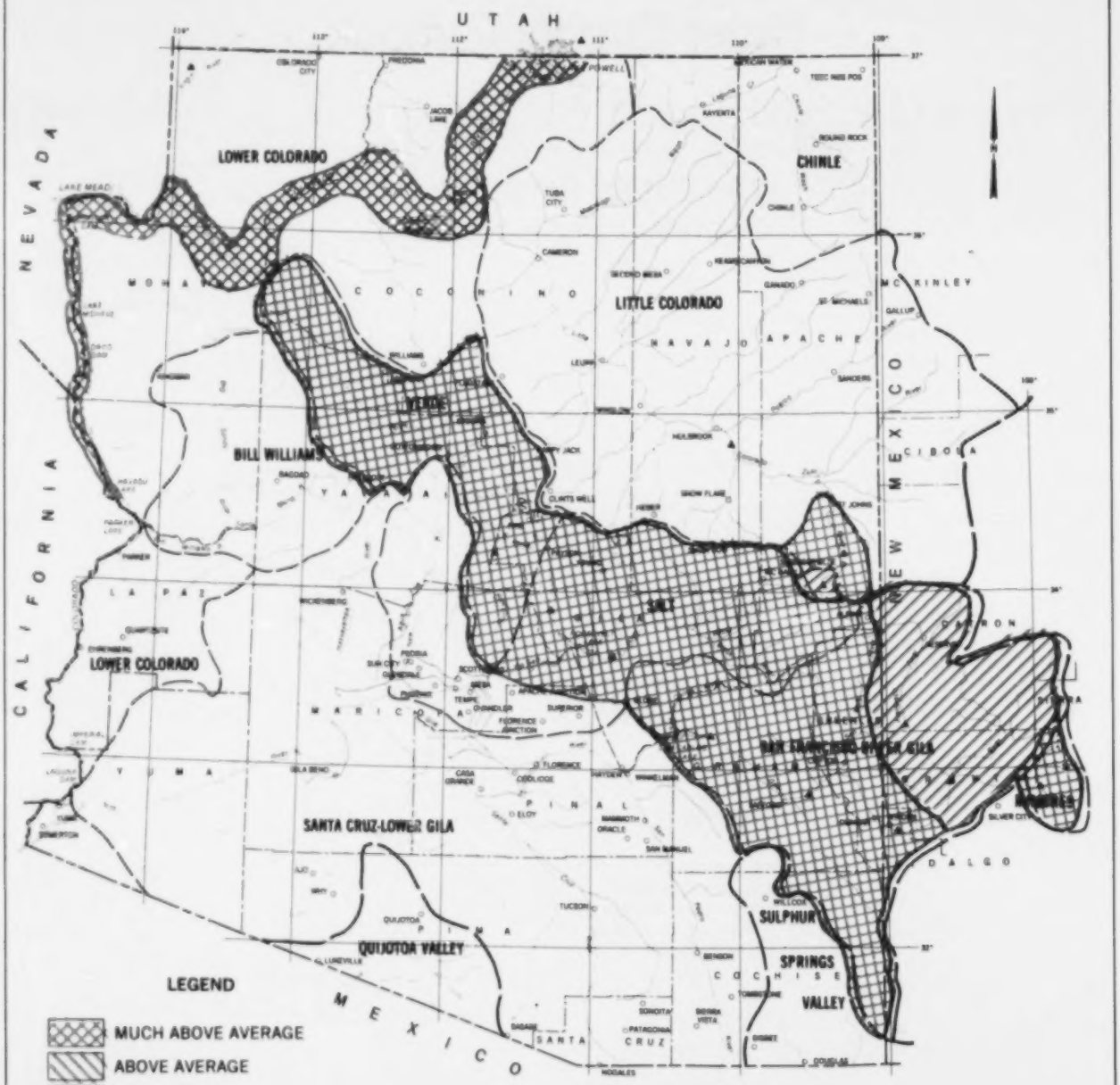
U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



STREAMFLOW PROSPECTS

ARIZONA

0 25 50 75 100 MI

0 50 100 150 KM

SOURCE: Data compiled by SCS Field Personnel.

MARCH 1985 4-R-39105

GENERAL OUTLOOK

SUMMARY:

Surface water supplies could be variable in Arizona and western New Mexico if the current weather patterns hold. While storage in major reservoirs is generally above average, streamflow forecasts for the January-May period call for only 40% to 75% of average runoff. The Salt River is forecast at 48%, the Verde River at 39%, and Tonto Creek at 21%. Total inflow to Salt River Project is forecast at 365,000 acre feet. The San Francisco River is forecast at 73% at Glenwood and 69% at Clifton. On the Gila River runoff is expected to be 70% at Gila, 65% at Virden, 62% at the Head of Safford Valley, and 64% at Calva. Inflow to San Carlos is forecast at 100,000 acre feet. The Little Colorado River should produce 50% of average inflow to Lyman Lake with 74% of average flow at Greer. The Mimbres River is forecast to run 54% of average. Inflow to Lake Powell on the Colorado River is forecast to be 10,600,000 acre feet at 142% of average.

SNOWPACK:

The snowpack is below average in almost all areas. Snow data collected near January 1 showed the snow water equivalent to be 53% of average on the Salt River, 84% on the Verde River, 50% on the San Francisco-Gila basin, 62% on the upper Little Colorado, and 25% on the Mimbres watershed. The areas running above average are the Grand Canyon at 120% and the San Francisco Peaks at 172%. The Chuska Mountains are estimated to be about 175% of average.

PRECIPITATION:

Precipitation for the total October-December period has ranged from 93% on the Salt River basin to 156% on the Mimbres watershed. October precipitation ran from 81% on the Lower Colorado River area of northwest Arizona to 326% on the Mimbres. Western New Mexico stations received the greatest amounts in October. In November, the storms produced more in Arizona and precipitation ranged from 142% on the Mimbres to 298% on the Verde River basin. It was the November precipitation that established the snowpack. December was very dry, ranging from 14% of average on the Verde and Mimbres watersheds to 44% on the Lower Colorado area.

RESERVOIRS:

Major reservoirs reported generally above average storage for January 1. A combined storage of 1,670,000 acre feet was reported by Salt River Project at 83% of capacity. San Carlos was 89% full with 830,000 acre feet. Lake Pleasant contained 82,000 acre feet at 52% of capacity. Lake Powell, Mead, Mohave, and Havasu on the Colorado River held 48,693,000 acre feet at 91% of capacity. Lyman Lake held 22,500 acre feet and Showlow Lake, 2,200 acre feet. Near Prescott, Watson Lake contained 3,500 acre feet and Willow Lake 3,700 acre feet.

STREAMFLOW:

With the exception of the Verde River and Tonto Creek, most major streams had near to above average runoff in October and November. December was a very dry month and streamflow declined to well below average.

Observed Streamflow - January 1, 1986

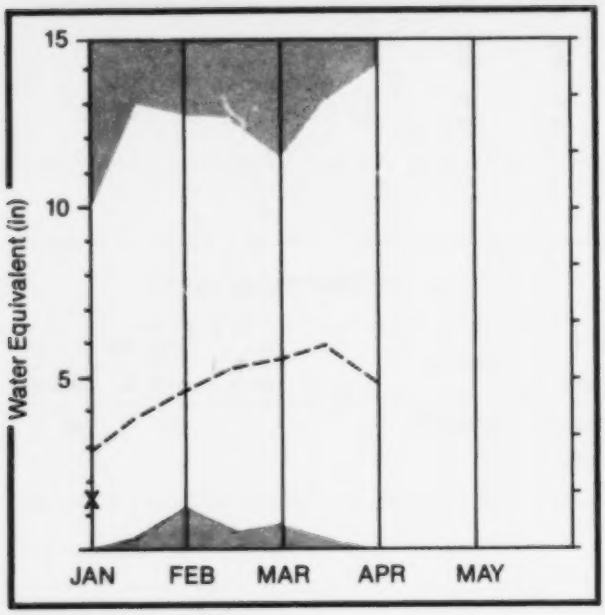
1985 Streamflow - % of Average

Stream	Oct.	Nov.	Dec.
San Francisco - Glenwood	149	131	---
San Francisco - Clifton	171	95	47
Gila - Gila	500	98	---
Gila - Virden	644	158	72
Gila - Solomon	348	144	58
Gila - Calva	375	229	105
Salt - Roosevelt	97	149	69
Verde - abv. Horseshoe	65	182	70
Tonto Cr. - Roosevelt	44	560	33

All streamflow forecasts are coordinated between the Soil Conservation Service and the National Weather Service. All averages and percentages of average are based on the 20 year period 1961-1980.

Salt River Basin

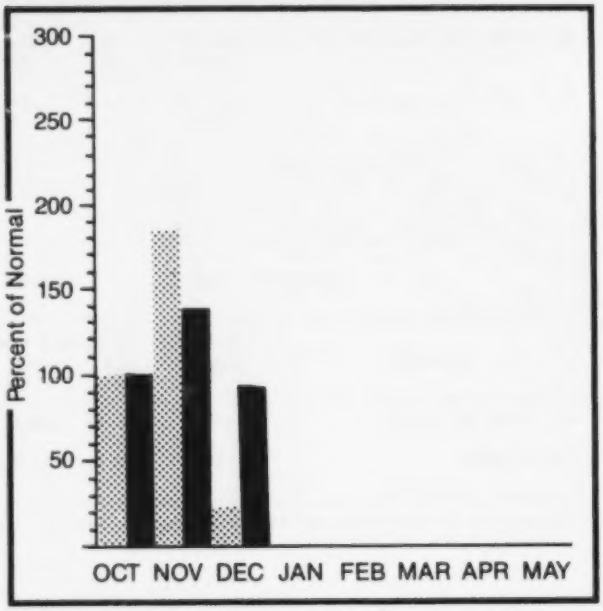
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

January 1, 1986

January-May runoff on the Salt River is forecast to be 48% of average and on Tonto Creek, 21% of average. While total precipitation since October 1 has been 93% of average, December was very dry. The January 1 snowpack was only 53% of average. Observed runoff for the Salt River was 97% in October, 149% in November, and 69% in December. The Salt River Project reservoirs on the Salt River held 1,448,000 acre feet at 85% of capacity. Lake Pleasant was 52% full with 82,000 acre feet.

For further information contact your local Soil Conservation Service office.

SALT RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SALT RIVER near Roosevelt	JAN-MAY	466	225	48	112	14				
	JANUARY	53	25	47	260	18				
TONTO CREEK near Roosevelt	JAN-MAY	96.8	20	20	87	6				
	JANUARY	20	3	15	150	5				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
SALT RIVER RES SYSTEM	1709.0	1571.4	1448.3	1115.0
LAKE PLEASANT	157.6	107.5	82.4	67.0

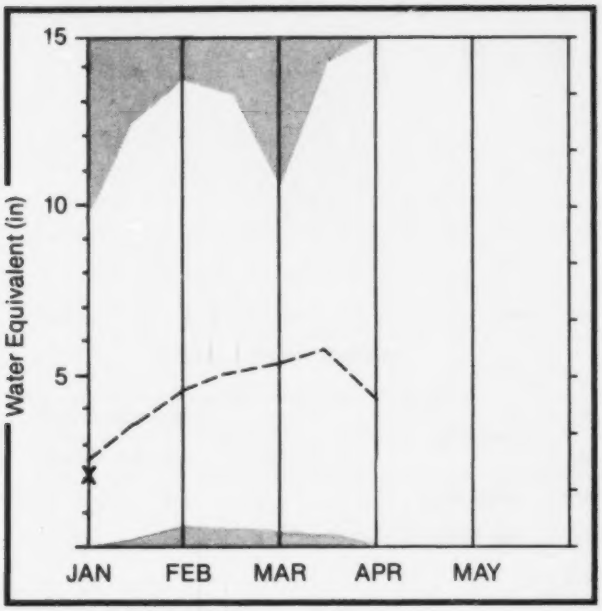
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
SALT RIVER	8	34	53

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Verde River Basin

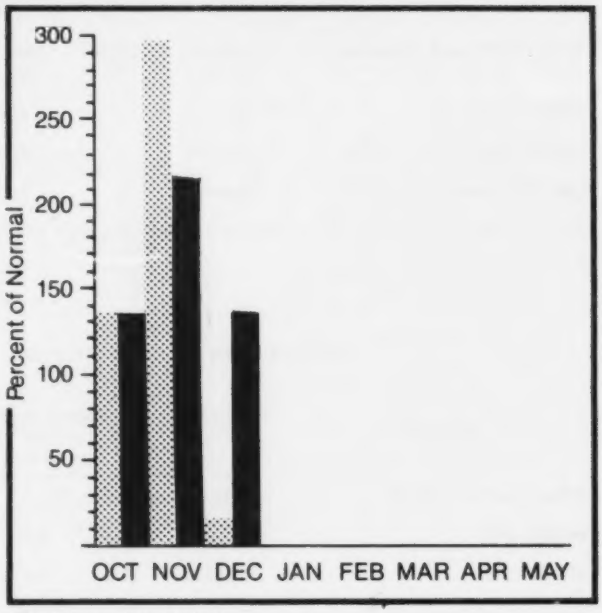
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

January 1, 1986

The Verde River is forecast to run only 39% of average over the January-May period. Inflow to Lake Mary is expected to be near 5700 acre feet. Granite Creek and Willow Creek are forecast to produce only 900 and 800 acre feet respectively. Total precipitation since October 1 has been 134% of average, but December was only 14%. Observed flow on the Verde was 65% of average in October, 182% in November, and 70% in December. The January 1 snowpack was 84% of average. Salt River Project reservoirs on the Verde River held 222,000 acre feet at 72% of capacity. Watson Lake held 3500 acre feet and Willow Lake 3700 acre feet.

For further information contact your local Soil Conservation Service office.

VERDE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
VERDE RIVER above Horseshoe	JAN-MAY	308.6	120	38	143	19				
	JANUARY	48	20	41	110	29				
GRANITE CREEK	JAN-MAY	---	0.9							
WILLOW CREEK	JAN-MAY	---	0.8							
LAKE MARY INFLOW	JAN-MAY	---	5.7							

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
VERDE RIVER RES SYSTEM	309.6	210.5	222.4	108.0
WATSON LAKE	4.7	4.6	3.5	2.2
WILLOW CREEK	6.1	4.2	3.7	2.1

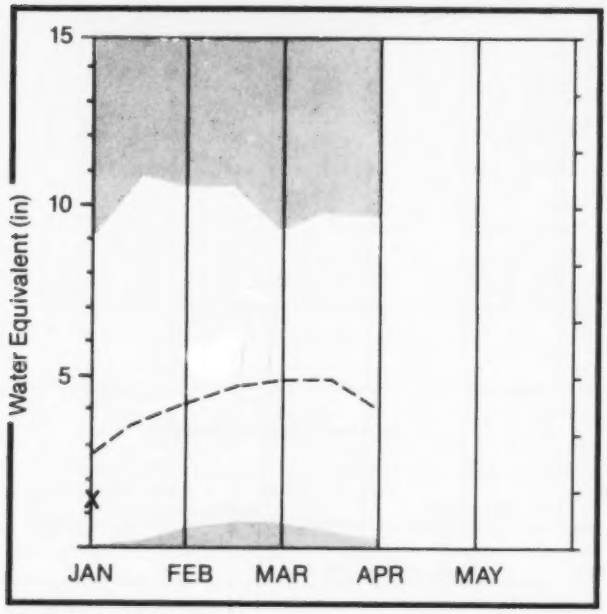
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
VERDE RIVER	10	38	84
SAN FRANCISCO PEAKS	4	99	172

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

San Francisco - Upper Gila River Basin

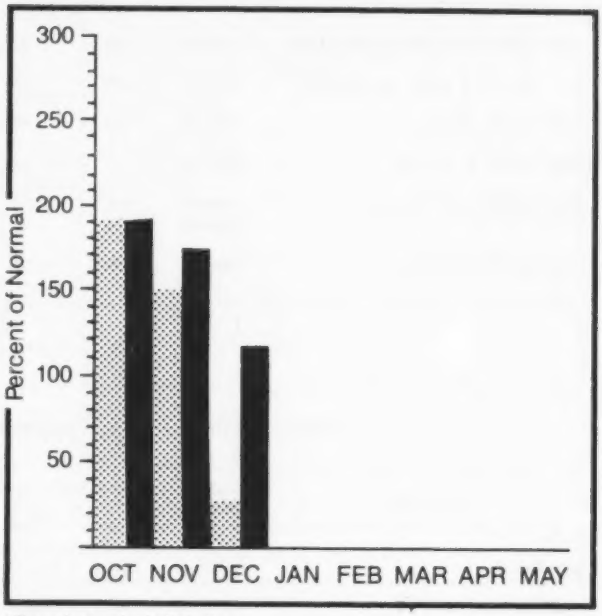
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

January 1, 1986

WATER SUPPLY OUTLOOK:

January-May streamflow forecasts are below average on the San Francisco and Gila Rivers. Runoff is forecast to be 69% of average at Clifton, 65% at Virden, and 62% at the Head of Safford Valley. Inflow to San Carlos reservoir at Calva is forecast at 100,000 acre feet or 64% of average. Total October-December precipitation was 118% of average while December itself was only 30%. Snow water equivalent on January 1 was only 50% of average. Streamflow at Solomon was 348% of average in October, 144% in November, and 58% in December. Storage in San Carlos reservoir was 830,000 acre feet at 89% of capacity. Painted Rock reservoir held 28,000 acre feet.

For further information contact your local Soil Conservation Service office.

SAN FRANCISCO - UPPER GILA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SAN FRANCISCO RIVER at Glenwood	JAN-MAY	41	30	73	178	12				
SAN FRANCISCO RIVER at Clifton	JAN-MAY	94	65	69	229	13				
GILA RIVER at Gila	JAN-MAY	69	48	69	162	21				
GILA RIVER at Virden	JAN-MAY	92	60	65	163	16				
GILA RIVER near Solomon	JAN-MAY	200	123	61	226	13				
	JANUARY	34	15	44	161	23				
GILA RIVER at Calva	JAN-MAY	156	100	64	219	5				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
SAN CARLOS	935.0	924.6	830.3	233.0
PAINTED ROCK DAM	2492.0	98.8	28.1	-----

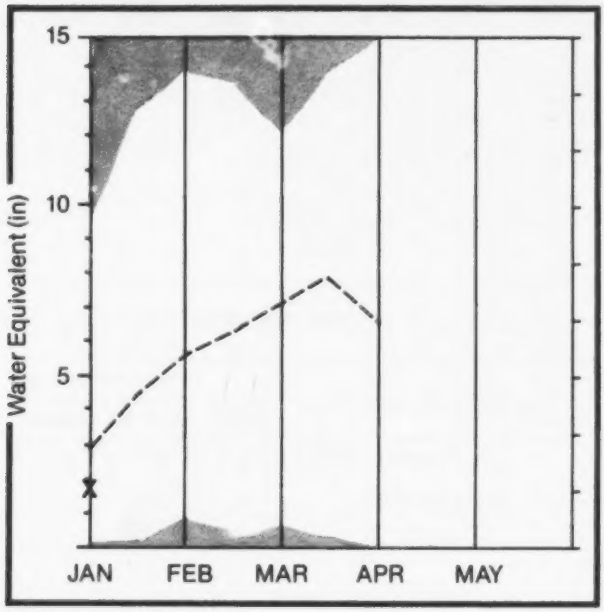
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
SAN FRANCISCO/GILA RIVER	7	29	52

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Little Colorado River Basin

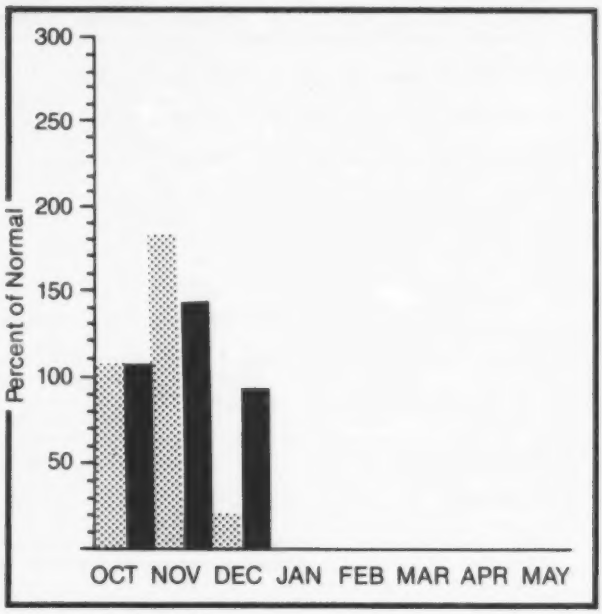
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

January 1, 1986

Runoff on the upper Little Colorado River is forecast to be 50% of average at Lyman reservoir and 74% at Greer over the January-June period. Precipitation has averaged 96% since October 1, but only 21% in December. The January 1 snowpack was rated at 62% of average. The Chuska Mountains are estimated to be about 175% of average. Reservoir storage on January 1 was 22,500 acre feet in Lyman reservoir and 2200 acre feet in Showlow Lake.

For further information contact your local Soil Conservation Service office.

LITTLE COLORADO RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LITTLE COLORADO RIVER at Greer	JAN-JUN	8.8	6.5	73	181	45				
LITTLE COLORADO RIVER ab Lyman Res	JAN-JUN	14.2	7.4	52	162	21				
LITTLE COLORADO RIVER at Woodruff	NOV-JUN	17.3	15	86	231	5				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
LYMAN RESERVOIR	---	24.4	22.5	-----
SHOW LOW LAKE	5.1	5.1	2.2	-----

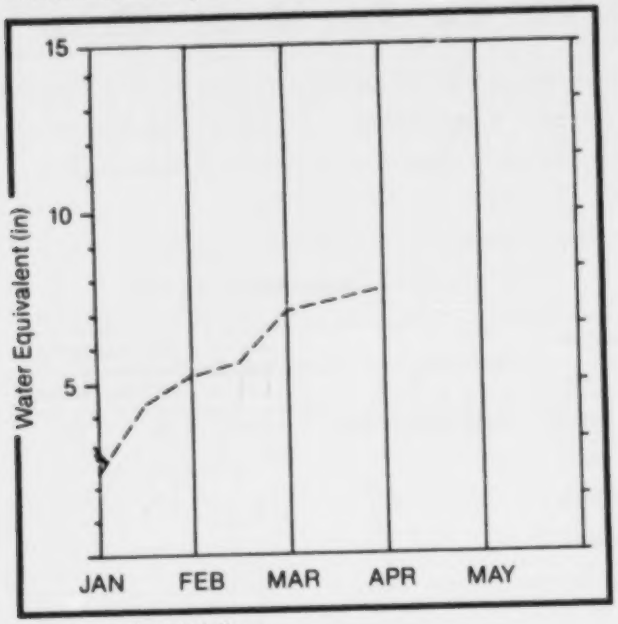
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
LITTLE COLORADO RIVER	5	34	61
CHUSKA MOUNTAINS	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Lower Colorado River Basin

Mountain snowpack* (inches)

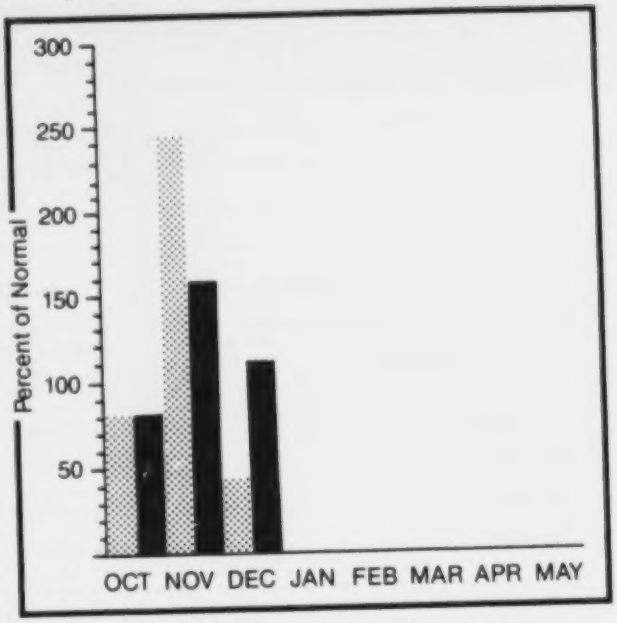


*Based on selected stations

Maximum ———— Average – – – –

Minimum ———— Current ————

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation ▒ Year to date precipitation ■

January 1, 1986

WATER SUPPLY OUTLOOK:

Inflow to Lake Powell on the Colorado River is forecast to be 10,600,000 acre feet or 142% of average over the period April through July. The April-June forecast for the Virgin River at Littlefield is for 69% of average flow. Precipitation in northwestern Arizona ran 112% of average for October through December. December was only 44% of average. The January 1 snowpack was rated at 120% of average, mainly in the area of the Grand Canyon. Combined storage in Lakes Powell, Mead, Mohave, and Havasu was 48,692,600 acre feet on January 1 at 91% of capacity. Water releases at Parker Dam were reported to be 21,900 cubic feet per second near January 1.

For further information contact your local Soil Conservation Service office.

LOWER COLORADO RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
VIRGIN RIVER near Littlefield	APR-JUN	62	42.5	68	132	27				
INFLOW to LAKE POWELL	APR-JUL	7462	10600	142	192	99				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
LAKE HAVASU	619.4	581.3	588.6	546.0
LAKE MOHAVE	1810.0	1523.0	1422.0	1605.0
LAKE MEAD	26159.0	24070.0	23683.0	18176.0
LAKE POWELL	25002.0	22605.0	22999.0	12625.0

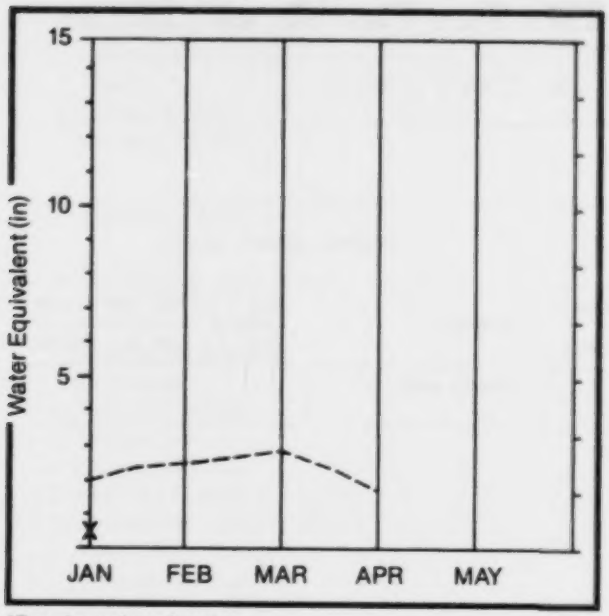
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
LOWER COLORADO RIVER	2	53	122

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Mimbres River Basin

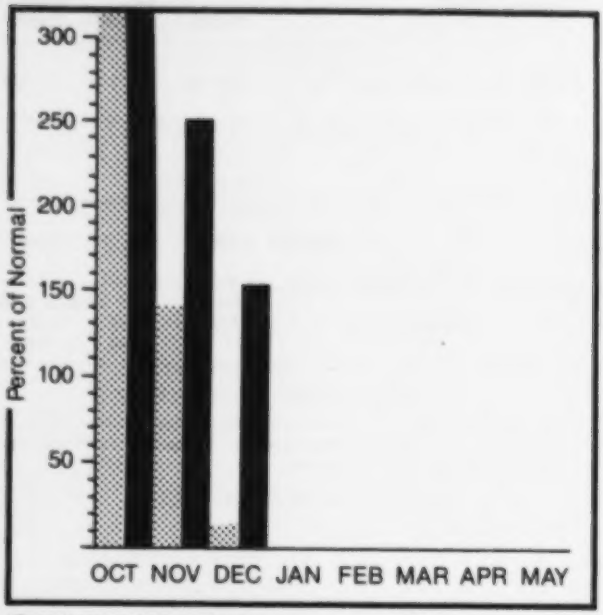
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

January 1, 1986

The discharge of the Mimbres River is forecast to be 54% of average for January through May. Although precipitation has averaged 156% since October 1, December precipitation was only 14% of average. The January 1 snowpack was only 25% of average.

For further information contact your local Soil Conservation Service office.

MIMBRES RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MIMBRES RIVER near Mimbres	JAN-MAY	5.4	2.9	53	185	18				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
MIMBRES RIVER	3	20	27

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

DATA SITES USED TO DETERMINE SNOW PACK WATER EQUIPMENT

SALT RIVER

Baldy
Beaverhead
Coronado Trail
Forest Dale Alternate
Hannagan Meadows
Heber
Maverick Fork
Workman Creek

VERDE RIVER

Baker Butte
Baker Butte #2
Chalender
Copper Basin Divide
Fort Valley
Gaddes Canyon
Happy Jack
Mingus Mountain
Morman Mountain
Mormon Mt. Summit #2
White Horse Lake Jct.
Williams Ski Run

GILA/SAN FRANCISCO RIVER

Beaverhead
Coronado Trail
Frisco Divide
Hannagan Meadows
Signal Peak Snotel
Silver Creek Divide
State Line

LITTLE COLORADO RIVER

Baldy
Cheese Spring
Heber
Nutrioso
Promontory Butte

LOWER COLORADO RIVER

Bright Angel
Grand Canyon

SAN FRANCISCO PEAKS

Inner Basin #1
Inner Basin #2
Snow Bowl #1 Alternate
Snow Bowl #2

CHUSKA MOUNTAINS

Bowl Canyon
Tsaile Canyon #1
Tsaile Canyon #2
Wheatfields
Whiskey Creek

MIMBRES RIVER

Emory Pass #2
McKnight Cabin
Signal Peak Snotel

STATIONS USED TO DETERMINE PERCENT OF NORMAL PRECIPITATION

SALT RIVER

Alpine R.S.
Baldy Snotel
Black River Pumps
Buck Spring Snotel
Coronado Trail Snotel
Hannagan Meadows Snotel
Heber Snotel
Maverick Fork Snotel
Pleasant Valley R.S.
Promontory Snotel
Sierra Ancha
Tonto Fish Hatchery
Wildcat Snotel
Workman Creek Snotel

LITTLE COLORADO RIVER

Baldy Snotel
Buck Spring Snotel
Flagstaff
Heber Snotel
Holbrook
Mormon Mountain Snotel
Promontory Snotel
Springerville
Tuba City
Window Rock

LOWER COLORADO RIVER

Bright Angel
Colorado City
Fredonia
Grand Canyon
Kingman
Page
Williams

VERDE RIVER

Ashfork
Baker Butte Snotel
Beaver Creek R.S.
Copper Basin Divide
Flagstaff
Fort Valley
Fry Snotel
Happy Jack
Mingus Mountain
Mormon Mountain Snotel
Payson R.S.
Prescott
Sugar Loaf Snotel
White Horse Lake Snotel

GILA/SAN FRANCISCO RIVER

Alpine R.S.
Beaverhead R.S.
Clifton
Coronado Trail Snotel
Frisco Divide Snotel
Hannagan Meadows Snotel
Lookout Mountain Snotel
Luna R.S.
Reserve R.S.
Safford Exp. Farm
Signal Peak Snotel
Silver City
Silver Creek Divide Snotel
Fort Bayard

MIMBRES RIVER

Mimbres R.S.
Signal Peak Snotel

The Following Organizations Cooperate With The Soil Conservation Service in Snow Survey Work

Federal

Department of Agriculture
- Soil Conservation Service
- Forest Service
  - Apache-Sitgreaves National Forest
  - Coconino National Forest
  - Coronado National Forest
  - Gila National Forest
  - Kaibab National Forest
  - Prescott National Forest
  - Tonto National Forest
  - Rocky Mountain Forest and Range Experiment Station

Department of Commerce
- NOAA, National Weather Service

Department of Interior
- Bureau of Reclamation
  - Region III
- Geological Survey
  - Arizona District
  - New Mexico District
- Bureau of Indian Affairs
  - Navajo Reservation
  - San Carlos Irrigation Project
- National Park Service
  - Grand Canyon National Park
- Gila Water Commissioner
  - Safford, Arizona

State

Arizona Department of Water Resources
Arizona Game and Fish Department
Arizona State Parks Board

Arizona State University
- Laboratory of Climatology
- (State Climatologist)

University of Arizona
- Arizona Agricultural Experiment Station
- Water Resource Research Center
- Department of Watershed Management

Municipal

City of Flagstaff

Irrigation Projects

Salt River Valley Water Users' Association
- Phoenix, Arizona

San Carlos Irrigation and Drainage District
- Coolidge, Arizona

Maricopa County Municipal Water Conservation District
- Peoria, Arizona

Indian Tribes

Navajo Nation
- Window Rock, Arizona

Private

Southwest Forest Industries, Inc.
- Phoenix, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

Soil
Conservation
Service

Arizona
Water Supply Outlook
February 1, 1986

NEWARK PUBLIC LIBRARY

Foreward

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 98502; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Arizona
Water Supply Outlook

and

Federal-State-Private
Cooperative Snow Surveys

Issued by

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Chief
Soil Conservation Service
Washington, D.C.

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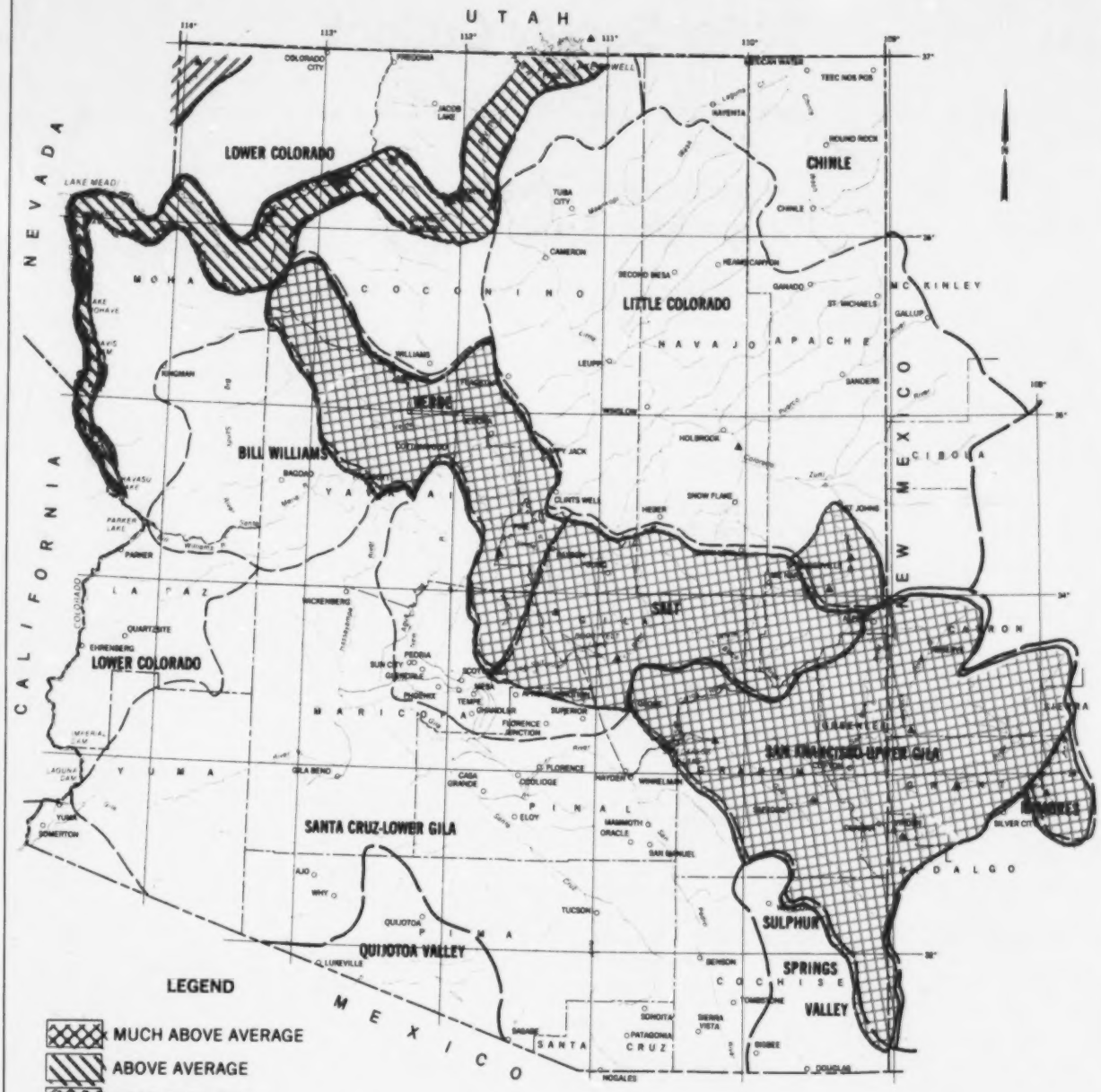
U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



LEGEND

- MUCH ABOVE AVERAGE
- ABOVE AVERAGE
- NEAR AVERAGE
- BELOW AVERAGE
- MUCH BELOW AVERAGE
- NOT FORECAST
- FORECAST POINT
- WATERSHED BOUNDARY
- SUB-WATERSHED BOUNDARY

STREAMFLOW PROSPECTS

ARIZONA

0 25 50 75 100 MI

0 50 100 150 KM

SOURCE: Data compiled by SCS Field Personnel.

MARCH 1985 4-R-39105

GENERAL OUTLOOK

SUMMARY:

Weather conditions remained dry throughout January causing a further reduction in the forecasts for streamflow over the February-May period in Arizona and western New Mexico. Storage in major reservoirs, which is still above average for February 1, will be a very important factor in surface water supplies in 1986. Over the next four months the Verde River is forecast to run 35% of average and the Salt River, 28%, with Tonto Creek expected to produce only 12% of average runoff. Inflow to the Salt River Project reservoirs from these three streams is forecast to be 215,000 acre feet. The San Francisco River is forecast to produce 42% of average flow at Clifton and Glenwood. It is anticipated that the Gila River will run 48% of average at Gila, 44% at Virden, 38% at the Head of Safford Valley, and 32% at Calva. Inflow to San Carlos reservoir is forecast at 40,000 acre feet. The Little Colorado River flow should be 45% of normal at Greer and 29% at Lyman reservoir. The Mimbres River is forecast to have 33% of average runoff. Spring runoff on the mainstream Colorado River is forecast to be 127% of average with 9,500,000 acre feet inflow to Lake Powell. Small watersheds contributing to reservoirs such as Lake Mary near Flagstaff and Willow and Watson Lakes near Prescott are expected to produce very little runoff.

SNOWPACK:

The Arizona-western New Mexico snowpack is much below average for February 1. Snow surveys and telemtry readings confirm a decrease in snow water equivalent as well as percent of average. This is due to a combination of much below average precipitation and loss from melt during periods of above average temperatures during January. Major basins have a February 1 snowpack ranging between 24% and 28% of average. The Grand Canyon area is down to 51%. Only the San Francisco Peaks and the Chuska Mountains are near average.

PRECIPITATION:

January precipitation was almost non existant. The percent of average precipitation received was 10% on the Verde and Lower Colorado areas, 17% on the Salt River, 18% over the Little Colorado basin, 11% on the San Francisco-Gila drainage, and 28% on the Mimbres. Storm systems began to enter the state just before February 1 and more storms are expected. This may alleviate the situation somewhat as February progresses.

RESERVOIRS: Reservoir storage on February 1 was above average in the major impoundments around Arizona. Salt River Project reported a system wide storage of 1,655,000 acre feet at 82% of capacity. San Carlos reservoir was 90% full with 840,000 acre feet. Lake Pleasant held 83,000 acre feet, 53% full. Storage in Lakes Powell, Mead, Mohave, and Havasu totaled 48,116,000 acre feet which accounts for 90% of the storage capacity. Smaller reservoirs appear to be maintaining their storage levels so far. Lyman reservoir contains 23,600 acre feet and Show Low Lake, 2000 acre feet. Watson Lake holds about 3700 acre feet and Willow Lake, 3600 acre feet. (Note: In the January 1, 1986 Water Supply Outlook, the reservoir storage volumes listed as "THIS YEAR" and "LAST YEAR" were interchanged. These columns should be switched.)

STREAMFLOW: Preliminary streamflow figures show much below average runoff on major streams during the month of January. This continues the trend that began in December.

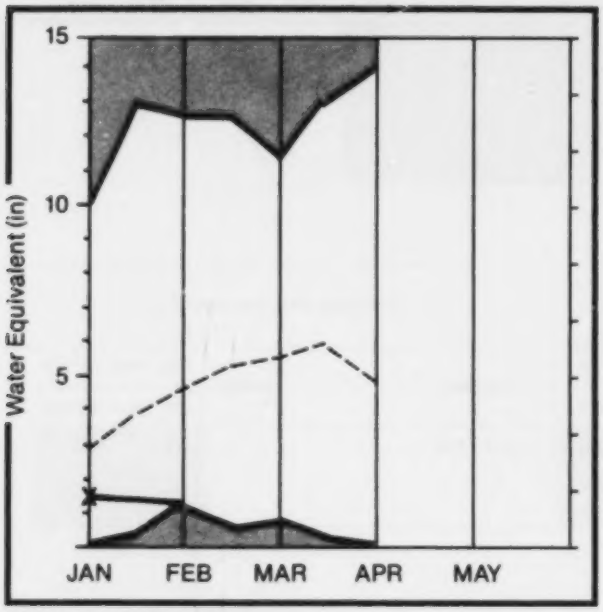
Preliminary Streamflow - January 1986

Stream	Thousands Acre Feet	Percent of Average
Salt River	22.0	41
Verde River	18.4	38
Tonto Creek	2.5	12
San Francisco River		
Clifton	7.7	51
Gila River		
Virden	8.6	57
Solomon	16.0	47
Calva	16.7	52

All streamflow forecasts are coordinated between the Soil Conservation Service and the National Weather Service. All averages and percentages of average are based on the 20 year period 1961-1980.

Salt River Basin

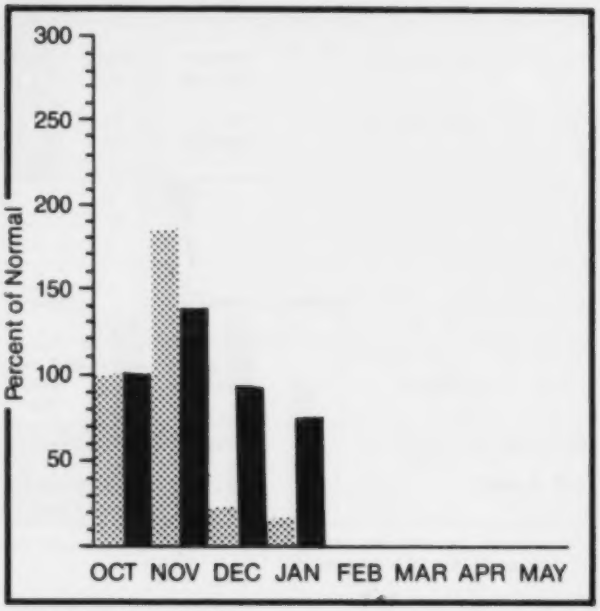
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

February 1, 1986

February-May forecasts call for 28% of average runoff on the Salt River and 12% of average on Tonto Creek. The February 1 snowpack was down to 26% of average. January precipitation was only 17% of average, bringing the water year precipitation to 74%. Observed January runoff on the Salt River was 41% of average and Tonto Creek, 12%. The four Salt River Project reservoirs were 84% full on February 1 with 1,442,000 acre feet in storage. Lake Pleasant held 83,000 acre feet at 53% of capacity.

For further information contact your local Soil Conservation Service office.

SALT RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SALT RIVER near Roosevelt	FEB-MAY	412.9	[illegible]	[illegible]	[illegible]	[illegible]				
	FEBRUARY	83.0	[illegible]	[illegible]						
TONTO CREEK near Roosevelt	FEB-MAY	76.8	[illegible]	[illegible]	[illegible]	[illegible]				
	FEBRUARY	28.0	[illegible]	[illegible]						

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
SALT RIVER RES SYSTEM	1709.0	[illegible]	[illegible]	[illegible]
LAKE PLEASANT	157.6	[illegible]	[illegible]	[illegible]

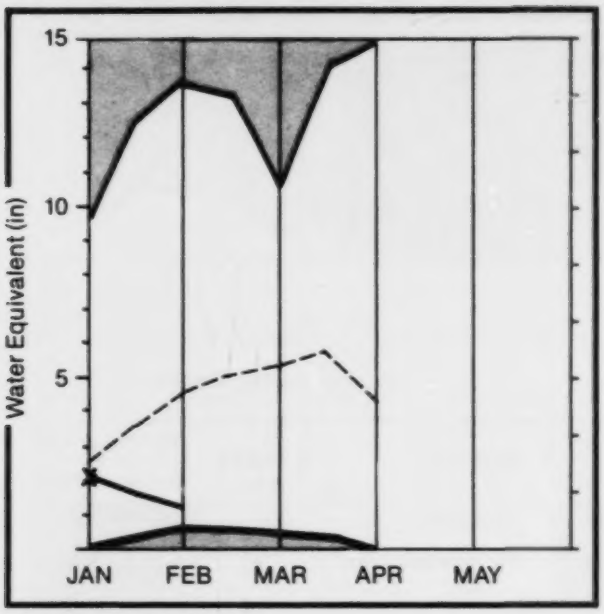
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
SALT RIVER	8	[illegible]	[illegible]

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Verde River Basin

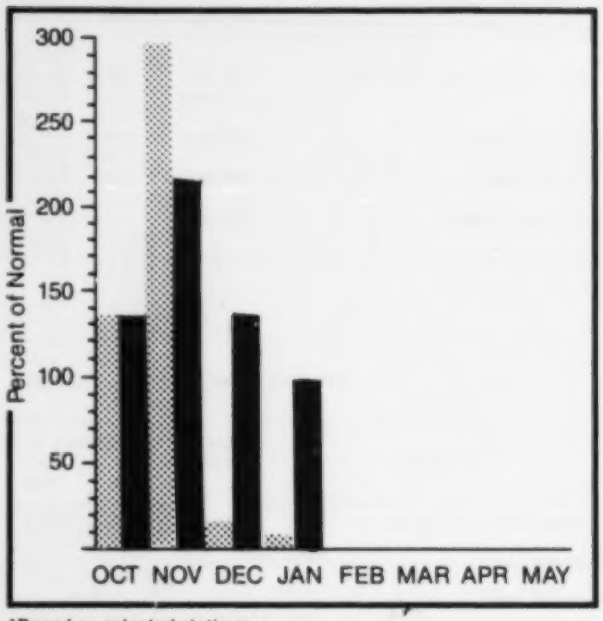
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

February 1, 1986

Runoff on the Verde River basin will be below average over the February-May period. The Verde is forecast to run 35% of average. Inflow to Lake Mary is only expected to be about 2200 acre feet. Granite Creek forecast is down to 600 acre feet and Willow Creek, 500 acre feet. Seasonal precipitation since October 1 is about normal, but January was only 10% of average. The February 1 snowpack was 27% of average. The San Francisco Peaks still maintain a near average snowpack due to snow received in November. Bartlett and Horseshoe reservoirs held a combined storage of 213,000 acre feet on February 1 at 69% of capacity. Storage in Watson Lake was 3670 acre feet and in Willow Lake, 3550 acre feet. The Verde River only ran 38% of average during January.

For further information contact your local Soil Conservation Service office.

VERDE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
VERDE RIVER above Horseshoe	FEB-MAY	260.1	91.0	35	141	20				
	FEBRUARY	79.0	13.0	16						
GRANITE CREEK	FEB-MAY	-----	0.6							
WILLOW CREEK	FEB-MAY	-----	0.5							
LAKE MARY INFLOW	FEB-MAY	-----	2.2							

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
VERDE RIVER RES SYSTEM	309.6	212.9	248.8	127.5
WATSON LAKE	4.7	3.7	4.3	2.7
WILLOW CREEK	6.1	3.6	4.1	2.7

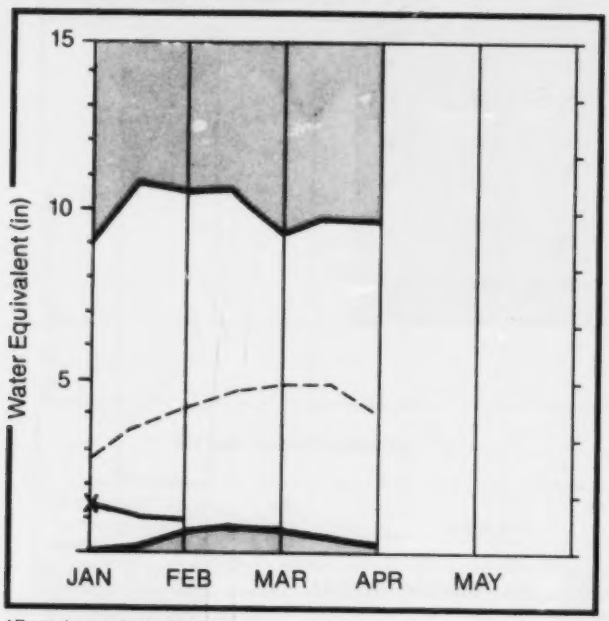
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
VERDE RIVER	10	15	38
SAN FRANCISCO PEAKS	4	49	186

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

San Francisco - Upper Gila River Basin

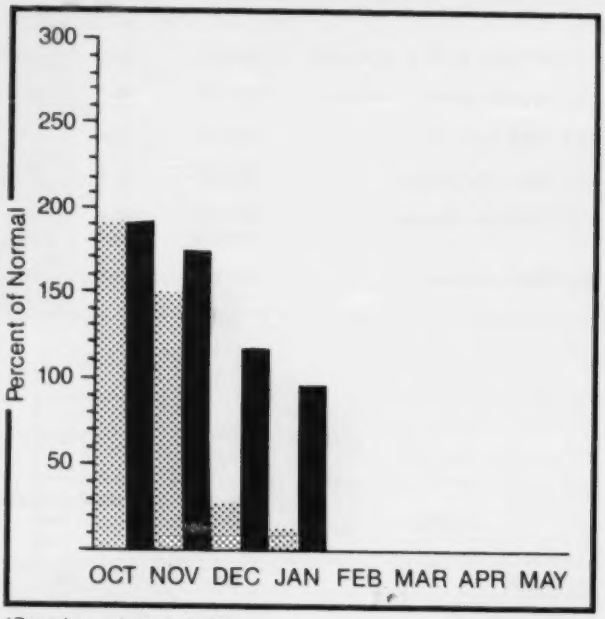
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

February 1, 1986

The overall Gila River basin is expected to produce about 40% of average February-May runoff. The San Francisco River at Clifton is forecast at 42%. The Gila forecast is 44% at Virden, 38% at Head of Safford Valley, and 32% at Calva. Inflow to San Carlos reservoir is predicted at 35,000 acre feet. The February 1 snowpack was 24% of average. Water year precipitation has been 95% of normal, but January was only 11% of average. San Carlos reservoir was at 90% of capacity on February 1 with 840,000 acre feet. Painted Rock on the lower Gila held 22,200 acre feet. Observed January runoff was 51% of average on the San Francisco at Clifton. The Gila ran 57% at Virden, 47% at Solomon, and 52% at Calva.

For further information contact your local Soil Conservation Service office.

SAN FRANCISCO - UPPER GILA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SAN FRANCISCO RIVER at Glenwood	FEB-MAY	36.0	[illegible]	[illegible]	[illegible]	[illegible]				
SAN FRANCISCO RIVER at Clifton	FEB-MAY	78.7	[illegible]	[illegible]	[illegible]	[illegible]				
GILA RIVER at Gila	FEB-MAY	60.0	[illegible]	[illegible]	[illegible]	[illegible]				
GILA RIVER near Virden	FEB-MAY	76.9	[illegible]	[illegible]	[illegible]	[illegible]				
GILA RIVER near Solomon	FEB-MAY	166.0	[illegible]	[illegible]	[illegible]	[illegible]				
	FEBRUARY	53.0	[illegible]	[illegible]						
GILA RIVER at Calva	FEB-MAY	124.0	[illegible]	[illegible]	[illegible]	[illegible]				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
SAN CARLOS	935.0	[illegible]	[illegible]	[illegible]
PAINTED ROCK DAM	2492.0	[illegible]	[illegible]	——

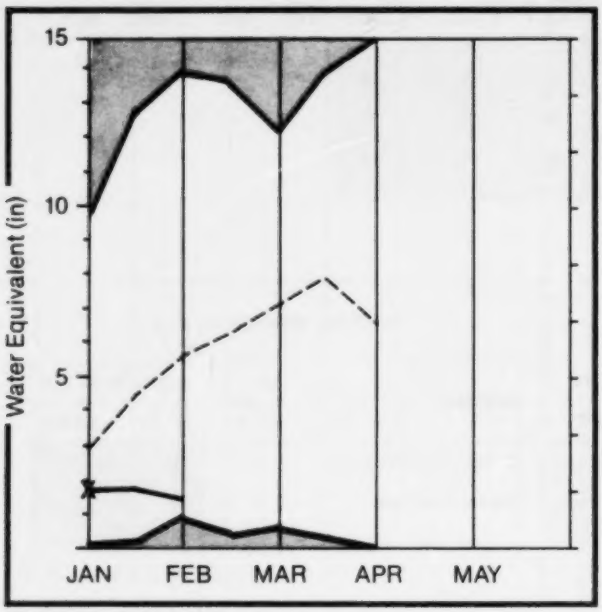
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
SAN FRANCISCO/GILA RIVER	7	[illegible]	[illegible]

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Little Colorado River Basin

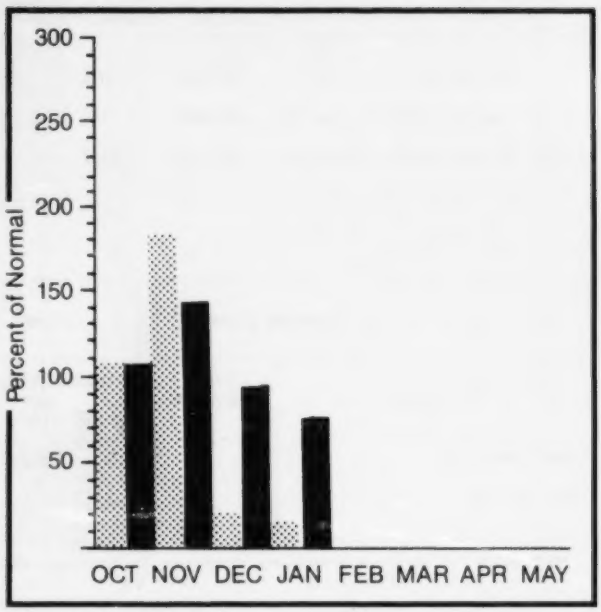
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

February 1, 1986

WATER SUPPLY OUTLOOK:

The Little Colorado River discharge for the February-June period is expected to be 45% of average at Greer and 29% of average at Lyman reservoir. The February 1 snowpack was only 27% of average. The snowpack in the Chuska Mountains is estimated to be about average. January precipitation over the basin was 18% of average, bringing the seasonal precipitation to 77% of average since October 1. Storage in Lyman reservoir has shown an increase and is now at 23,600 acre feet. Show Low Lake holds 2000 acre feet.

For further information contact your local Soil Conservation Service office.

LITTLE COLORADO RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LITTLE COLORADO RIVER at Greer	FEB-JUN	8.3	3.7	44	157	12				
LITTLE COLORADO RIVER ab Lyman Res	FEB-JUN	13.6	3.9	28	140	7				
LITTLE COLORADO RIVER at Woodruff *	NOV-JUN	17.3	6.0	34	156	17				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
LYMAN RESERVOIR	---	23.6	25.2	-----
SHOW LOW LAKE	5.1	2.0	5.1	-----

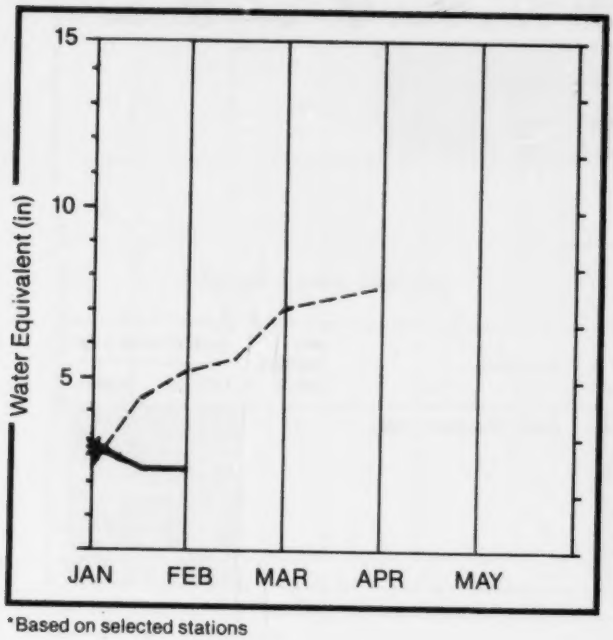
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
LITTLE COLORADO RIVER	5	17	27
CHUSKA MOUNTAINS	5	44	100

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Lower Colorado River Basin

Mountain snowpack* (inches)

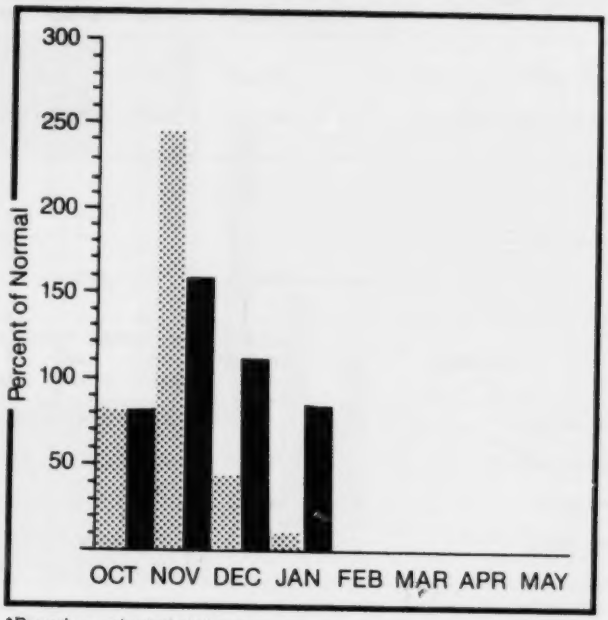


*Based on selected stations

Maximum ———— Average – – – –

Minimum ———— Current ————

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation ▒▒▒ Year to date precipitation ■■■

WATER SUPPLY OUTLOOK:

February 1, 1986

The April-July forecast for the Colorado River inflow to Lake Powell is 9,500,000 acre feet at 127% of average. The Virgin River is forecast to run 81% of average April through June. The snowpack in the Grand Canyon area was down to 51% of average on February 1. Precipitation over northwestern Arizona was only 10% of average in January. The water year so far has received 87% of average precipitation. The Colorado River reservoirs, Powell, Mead, Mohave, and Havasu, reported a combined storage of 48,116,000 acre feet near February 1. This is 90% of capacity. Releases from these dams were expected to range between 14,900 cfs and 23,000 cfs on February 1.

For further information contact your local Soil Conservation Service office.

LOWER COLORADO RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
VIRGIN RIVER near Littlefield	APR-JUN	62.0	50.0	80	139	82				
INFLOW to LAKE POWELL x	APR-JUL	7462.0	9300.0	127	170	89				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	xx USEABLE STORAGE xx THIS YEAR	LAST YEAR	AVE.
LAKE HAVASU	619.4	572.2	531.9	545.9
LAKE MOHAVE	1810.0	1647.0	1715.2	1471.0
LAKE MEAD	26159.0	23147.0	23928.0	18312.0
LAKE POWELL	25002.0	22750.0	21989.0	11851.0

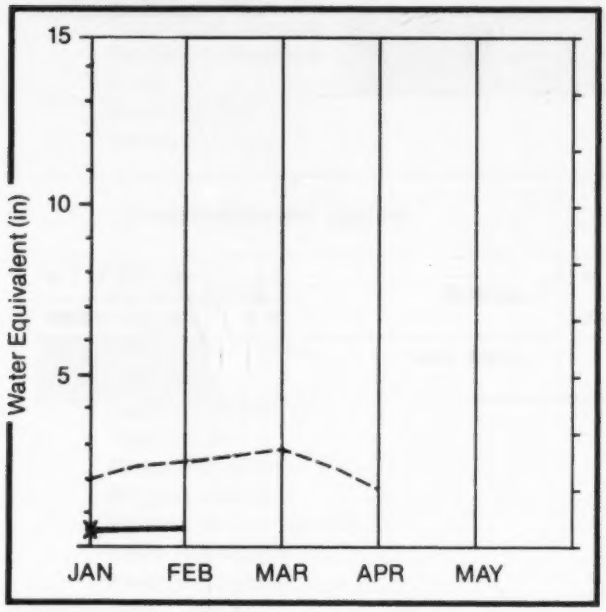
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
LOWER COLORADO RIVER	2	39	39

xCorrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Mimbres River Basin

Mountain snowpack* (inches)

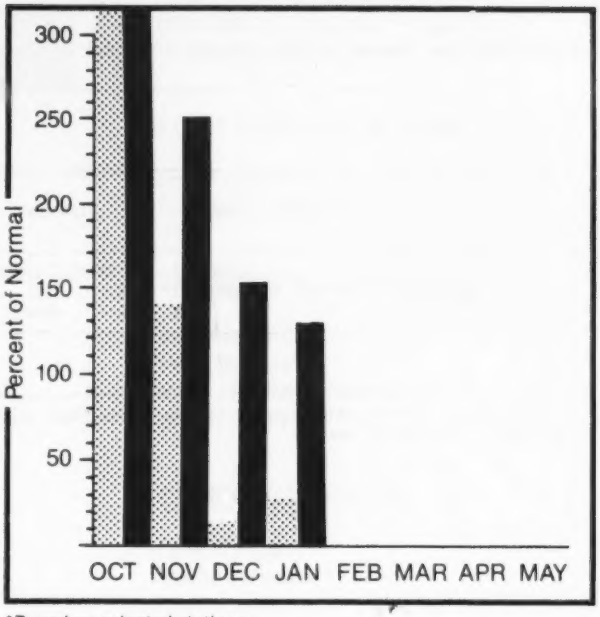


*Based on selected stations

Maximum ———— Average – – – –

Minimum ———— Current ————

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation ▒▒▒ Year to date precipitation ■■■

WATER SUPPLY

February 1, 1986

OUTLOOK: The February-May runoff of the Mimbres River is forecast to be only 33% of average. The February 1 snowpack was 28% of average. January precipitation was 28% of average. Water year precipitation has been 130% of average since October 1 but much of this came in October as rain and has already runoff.

For further information contact your local Soil Conservation Service office.

MIMBRES RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MIMBRES RIVER near Mimbres	FEB-MAY	4.5	1.0	22	178	22				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
MIMBRES RIVER	3	14	28

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

DATA SITES USED TO DETERMINE SNOW PACK WATER

SALT RIVER

Baldy
Beaverhead
Coronado Trail
Forest Dale Alternate
Hannagan Meadows
Heber
Maverick Fork
Workman Creek

VERDE RIVER

Baker Butte
Baker Butte #2
Chalender
Copper Basin Divide
Fort Valley
Gaddes Canyon
Happy Jack
Mingus Mountain
Morman Mountain
Mormon Mt. Summit #2
White Horse Lake Jct.
Williams Ski Run

GILA/SAN FRANCISCO RIVER

Beaverhead
Coronado Trail
Frisco Divide
Hannagan Meadows
Signal Peak Snotel
Silver Creek Divide
State Line

LITTLE COLORADO RIVER

Baldy
Cheese Spring
Heber
Nutrioso
Promontory Butte

LOWER COLORADO RIVER

Bright Angel
Grand Canyon

SAN FRANCISCO PEAKS

Inner Basin #1
Inner Basin #2
Snow Bowl #1 Alternate
Snow Bowl #2

CHUSKA MOUNTAINS

Bowl Canyon
Tsaile Canyon #1
Tsaile Canyon #2
Wheatfields
Whiskey Creek

MIMBRES RIVER

Emory Pass #2
McKnight Cabin
Signal Peak Snotel

STATIONS USED TO DETERMINE PERCENT OF NORMAL PRECIPITATION

SALT RIVER

Alpine R.S.
Baldy Snotel
Black River Pumps
Buck Spring Snotel
Coronado Trail Snotel
Hannagan Meadows Snotel
Heber Snotel
Maverick Fork Snotel
Pleasant Valley R.S.
Promontory Snotel
Sierra Ancha
Tonto Fish Hatchery
Wildcat Snotel
Workman Creek Snotel

LITTLE COLORADO RIVER

Baldy Snotel
Buck Spring Snotel
Flagstaff
Heber Snotel
Holbrook
Mormon Mountain Snotel
Promontory Snotel
Springerville
Tuba City
Window Rock

LOWER COLORADO RIVER

Bright Angel
Colorado City
Fredonia
Grand Canyon
Kingman
Page
Williams

VERDE RIVER

Ashfork
Baker Butte Snotel
Beaver Creek R.S.
Copper Basin Divide
Flagstaff
Fort Valley
Fry Snotel
Happy Jack
Mingus Mountain
Mormon Mountain Snotel
Payson R.S.
Prescott
Sugar Loaf Snotel
White Horse Lake Snotel

GILA/SAN FRANCISCO RIVER

Alpine R.S.
Beaverhead R.S.
Clifton
Coronado Trail Snotel
Frisco Divide Snotel
Hannagan Meadows Snotel
Lookout Mountain Snotel
Luna R.S.
Reserve R.S.
Safford Exp. Farm
Signal Peak Snotel
Silver City
Silver Creek Divide Snotel
Fort Bayard

MIMBRES RIVER

Mimbres R.S.
Signal Peak Snotel

The Following Organizations Cooperate With The Soil Conservation Service in Snow Survey Work

Federal

Department of Agriculture
- Soil Conservation Service
- Forest Service
  - Apache-Sitgreaves National Forest
  - Coconino National Forest
  - Coronado National Forest
  - Gila National Forest
  - Kaibab National Forest
  - Prescott National Forest
  - Tonto National Forest
  - Rocky Mountain Forest and Range Experiment Station

Department of Commerce
- NOAA, National Weather Service

Department of Interior
- Bureau of Reclamation
  - Region III
- Geological Survey
  - Arizona District
  - New Mexico District
- Bureau of Indian Affairs
  - Navajo Reservation
  - San Carlos Irrigation Project
- National Park Service
  - Grand Canyon National Park
- Gila Water Commissioner
  - Safford, Arizona

State

Arizona Department of Water Resources
Arizona Game and Fish Department
Arizona State Parks Board

Arizona State University
- Laboratory of Climatology
- (State Climatologist)

University of Arizona
- Arizona Agricultural Experiment Station
- Water Resource Research Center
- Department of Watershed Management

Municipal

City of Flagstaff

Irrigation Projects

Salt River Valley Water Users' Association
- Phoenix, Arizona

San Carlos Irrigation and Drainage District
- Coolidge, Arizona

Maricopa County Municipal Water Conservation District
- Peoria, Arizona

Indian Tribes

Navajo Nation
- Window Rock, Arizona

Private

Southwest Forest Industries, Inc.
- Phoenix, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

'86/3

United States Department of Agriculture

Soil Conservation Service

Phoenix, Arizona

Arizona Water Supply Outlook

March 1, 1986

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Foreward

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 98502; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Arizona
Water Supply Outlook

and

Federal-State-Private
Cooperative Snow Surveys

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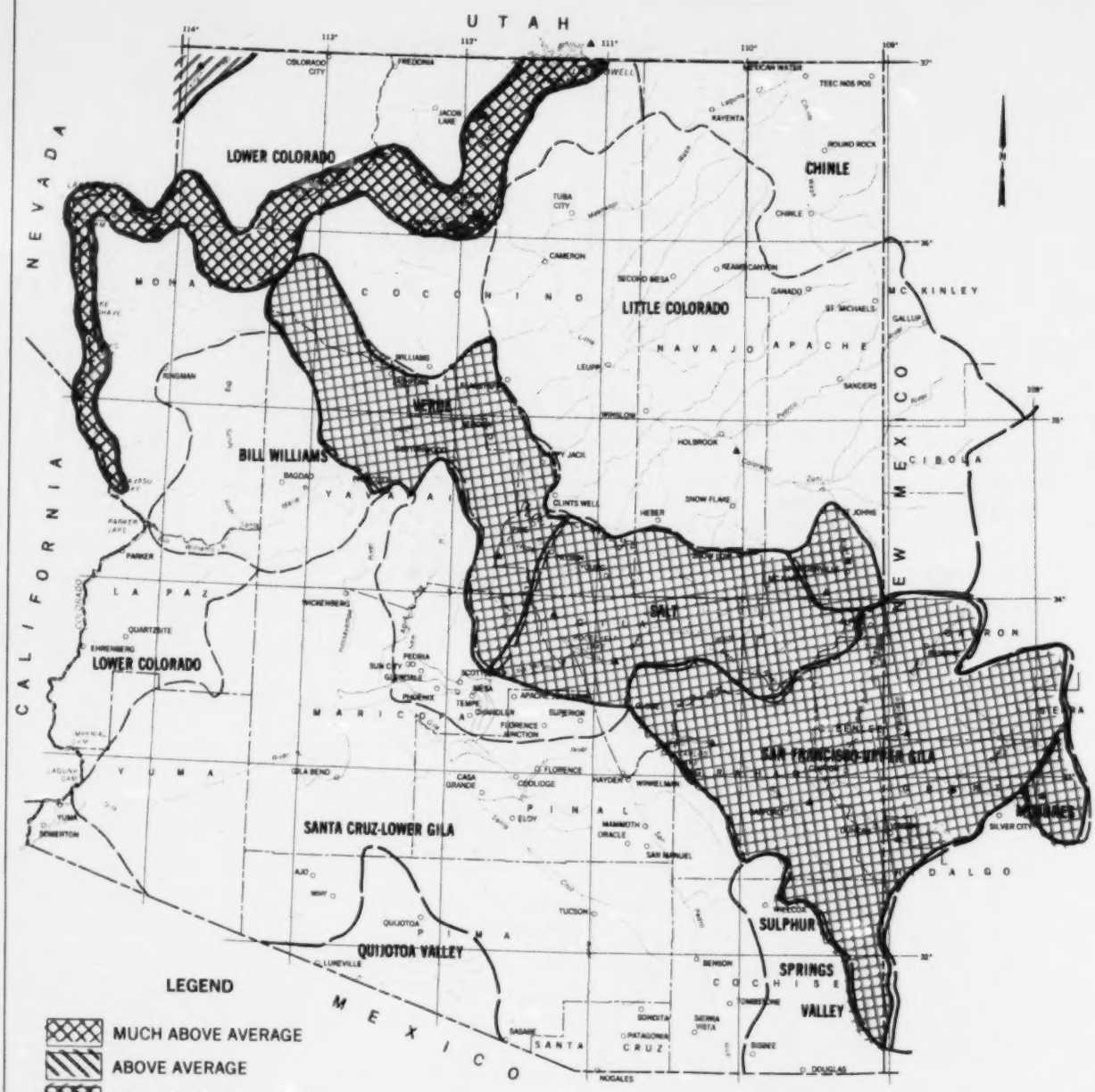
U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



STREAMFLOW PROSPECTS

ARIZONA

0 25 50 75 100 MI

0 50 100 150 KM

SOURCE: Data compiled by SCS Field Personnel.

MARCH 1985 4-R-39105

GENERAL OUTLOOK

SUMMARY: The general outlook still calls for variable surface water supplies in Arizona. Although reservoir storage is near to above normal for March 1, the forecasts for March-May streamflow are still well below average. This is somewhat of a paradox since fairly abundant precipitation, combined with snowmelt from a period of above average temperatures, produced near average runoff on many streams during February. Streamflow forecasts are low because very little snowpack remains. Runoff is expected to be 33% of average on the Salt River and 27% on the Verde. Inflow to Salt River Project is forecast at 167,000 acre feet. The San Francisco River is forecast to run 64% of average at Clifton. Forecast on the Gila River call for 67% of average at Virden, 62% at Head of Safford Valley, and 44% at Calva. Inflow to San Carlos reservoir should run 35,000 acre feet. The Little Colorado River is forecast to produce 34% of average flow at Lyman Lake. The forecast of the Colorado River at Lake Powell has increased to 11,000,000 acre feet at 147% as a result of February storms.

SNOWPACK: The March 1 snowpack is again much below average over most of the basins even after a significant increase in snowfall during mid February. Late February experienced a mini heat wave when temperatures over the state reached as much as 20 F. above normal for several days in succession. This resulted in rapid snow melt. Percent of average snow water on March 1 generally ranged from 23% on the Verde River to 63% in the Grand Canyon area. The extremes were 7% on the Mimbres and 99% on the San Francisco Peaks.

PRECIPITATION: February precipitation was well above average on most basins. The San Francisco-Gila River basin received the highest percent of average with 201%. The Lower Colorado River area in northwestern Arizona was the lowest with 82% of average. Precipitation was spread over the first 17 days of the month with a major storm at mid month which produced abundant snowfall. Very little precipitation occurred after this and most of the new snow melted before the end of the month. Water year precipitation is below average on the Salt, Little Colorado, and Lower Colorado basins, near average on the Verde River, and above average on the Mimbres and San Francisco-Gila watersheds.

RESERVOIRS: Near average to above average storage is reported in major Arizona reservoirs for March 1. The six Salt River Project reservoirs are reported to have a combined storage of 1,761,000 acre feet at 87% of capacity. San Carlos reservoir is 95% full with 890,000 acre feet. Storage in Lake Pleasant is 83,000 acre feet at 53% of capacity. Total storage in Lakes Powell, Mead, Mohave and Havasu is 47,924,000 acre feet which is 89% of capacity. February runoff has increased the storage in many smaller reservoirs. Watson Lake holds 4170 acre feet and Willow Lake, 3580 acre feet. Lyman Lake contains 24,400 acre feet while Show Low Lake has increased to 2600 acre feet.

STREAMFLOW: Runoff increased in February in response to rain during the first half of the month and fairly rapid snowmelt toward the end of the month. All major streams showed a dramatic increase in volume on February 16. Flow began to drop off by February 22 on most streams. The Salt River flow remained fairly high to the end of the month. Even with this the percent of average runoff was variable.

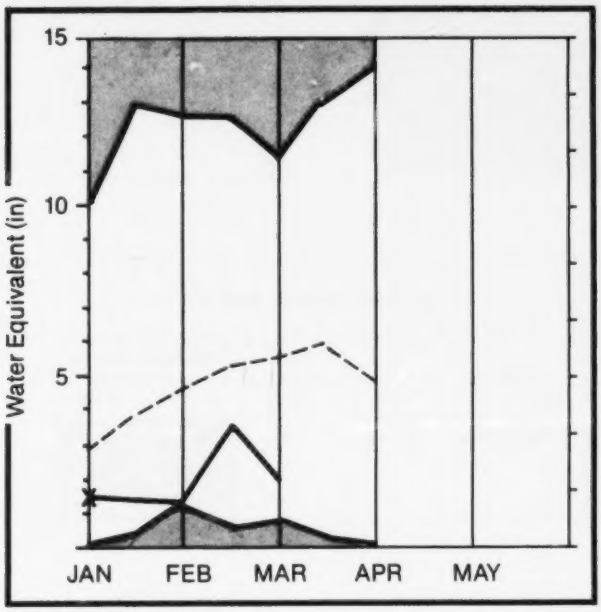
Preliminary Streamflow - February 1986

Stream	Thousands of Acre Feet	Percent of Average
Salt River	82.3	99
Verde River	42.5	41
Tonto Creek	11.7	54
San Francisco River		
Clifton	23.0	102
Gila River		
Virden	29.3	127
Solomon	48.8	92
Calva	40.4	91

All streamflow forecasts are coordinated between the Soil Conservation Service and the National Weather Service. All averages and percentages of average are based on the 20 year period 1961-1980.

Salt River Basin

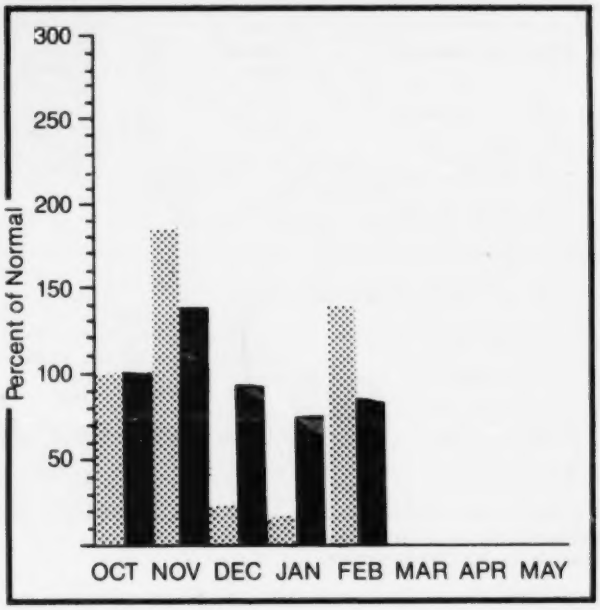
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

March 1, 1986

March-May runoff is forecast to be 33% of average on the Salt River and 14% on Tonto Creek. February precipitation was 141% of average, but snow deposited on the White Mountains has already sustained significant melt. The March 1 snowpack was 34% of average. February runoff was near average on the Salt River but about half of average on Tonto Creek. Four Salt River Project reservoirs on the Salt River held 1,537,000 acre feet at 90% of capacity. Lake Pleasant reported 83,000 acre feet in storage at 53% of capacity.

For further information contact your local Soil Conservation Service office.

SALT RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SALT RIVER near Roosevelt	MAR-MAY	329.7	110.0	33	57	13				
	MARCH	125.6	40.0	31						
TONTO CREEK near Roosevelt	MAR-MAY	48.3	7.0	14	72	6				
	MARCH	34.1	3.5	10						

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
SALT RIVER RES SYSTEM	1709.0	1337.3	1436.0	1199.8
LAKE PLEASANT	157.6	85.4	122.9	77.8

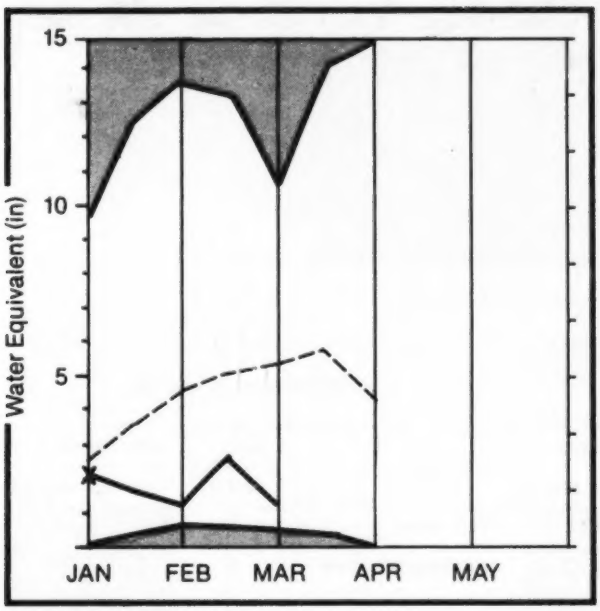
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
SALT RIVER	8	82	98

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Verde River Basin

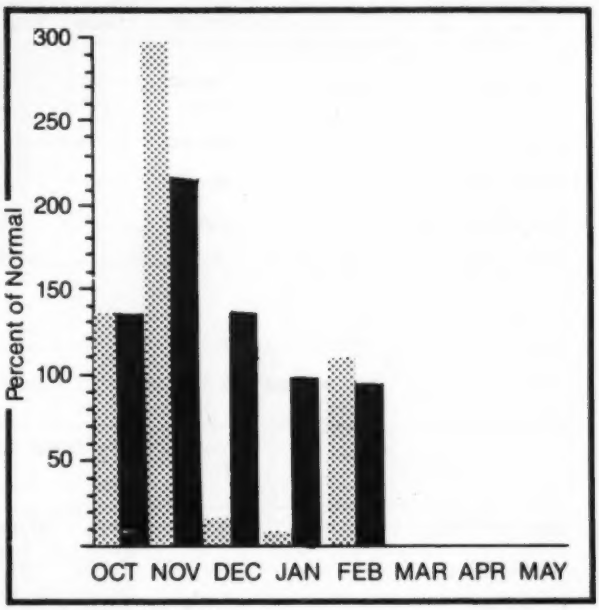
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

March 1, 1986

WATER SUPPLY OUTLOOK:

The Verde River is forecast to produce only 27% of average runoff over the March-May period. Inflow to Lake Mary is forecast at 1600 acre feet. Runoff is expected to be only 500 acre feet on Grante Creek and 400 acre feet on Willow Creek. January precipitation was 110% of average on the watershed but the monthly runoff was 41% of average even with practically all of the snowpack melting. The March 1 snowpack was only 23% of average. The San Francisco Peaks snowpack is still normal for March 1. Combined storage in Bartlett and Horseshoe reservoirs was 224,000 acre feet accounting for 72% of their capacity. Watson Lake was up to 4170 acre feet storage and Willow Lake, 3580 acre feet.

For further information contact your local Soil Conservation Service office.

VERDE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
VERDE RIVER above Horseshoe	MAR-MAY	181.5	[illegible]	[illegible]	[illegible]	[illegible]				
	MARCH	100.4	[illegible]	[illegible]						
GRANITE CREEK	MAR-MAY	---	[illegible]							
WILLOW CREEK	MAR-MAY	---	[illegible]							
LAKE MARY INFLOW	MAR-MAY	---	[illegible]							

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
VERDE RIVER RES SYSTEM	309.6	[illegible]	[illegible]	[illegible]
MATSON LAKE	4.7	[illegible]	[illegible]	[illegible]
WILLOW CREEK	6.1	[illegible]	[illegible]	[illegible]

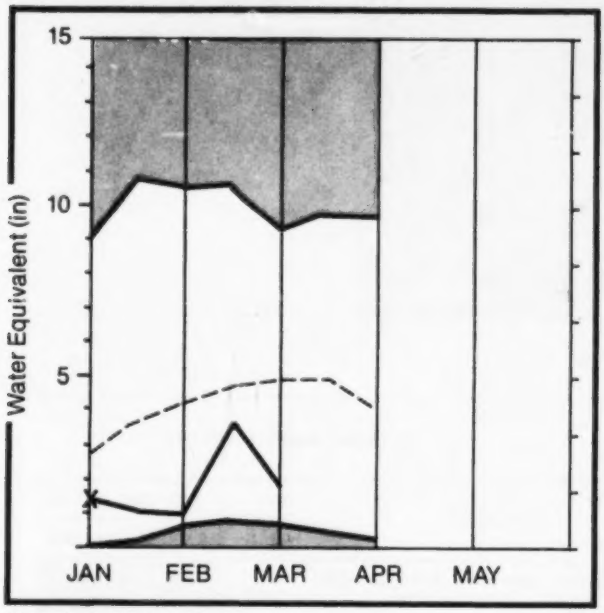
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
VERDE RIVER	10	[illegible]	[illegible]
SAN FRANCISCO PEAKS	4	[illegible]	[illegible]

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

San Francisco - Upper Gila River Basin

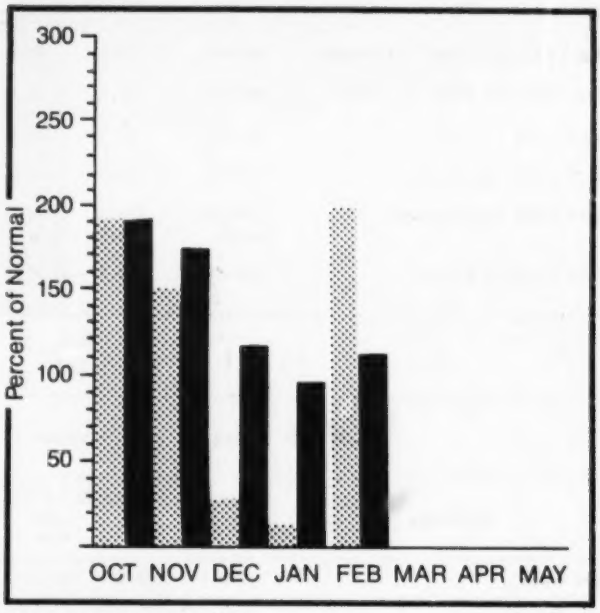
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

March 1, 1986

WATER SUPPLY OUTLOOK:

Runoff from the Gila River basin for March through May is forecast to be near 62% of average. Forecasts range from 74% at Gila to 44% at Calva. The San Francisco River is forecast to run 64% at Clifton. Runoff at Virden should be 67% of average and at Head of Safford Valley, 62%. San Carlos inflow is forecast at 35,000 acre feet. The basin received twice the normal February precipitation and streamflow for the month was near average. Much of the snowpack melted. The March 1 snow water equivalent was 38% of average. San Carlos storage increased to 890,000 acre feet at 95% of capacity.

For further information contact your local Soil Conservation Service office.

SAN FRANCISCO - UPPER GILA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SAN FRANCISCO RIVER at Glenwood	MAR-MAY	27.5	[illegible]	[illegible]	[illegible]	[illegible]				
SAN FRANCISCO RIVER at Clifton	MAR-MAY	56.2	[illegible]	[illegible]	[illegible]	[illegible]				
GILA RIVER at Gila	MAR-MAY	43.4	[illegible]	[illegible]	[illegible]	[illegible]				
GILA RIVER near Virden	MAR-MAY	53.9	[illegible]	[illegible]	[illegible]	[illegible]				
GILA RIVER near Solomon	MAR-MAY MARCH	117.8 55.8	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]	[illegible] [illegible]				
GILA RIVER at Calva	MAR-MAY	79.4	[illegible]	[illegible]	[illegible]	[illegible]				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USABLE CAPACITY	END OF USABLE STORAGE THIS YEAR	END OF USABLE STORAGE LAST YEAR	END OF USABLE STORAGE AVE.*
SAN CARLOS	1235.0	[illegible]	[illegible]	[illegible]
PACHTED ROCK DAM	2492.0	[illegible]	[illegible]	—

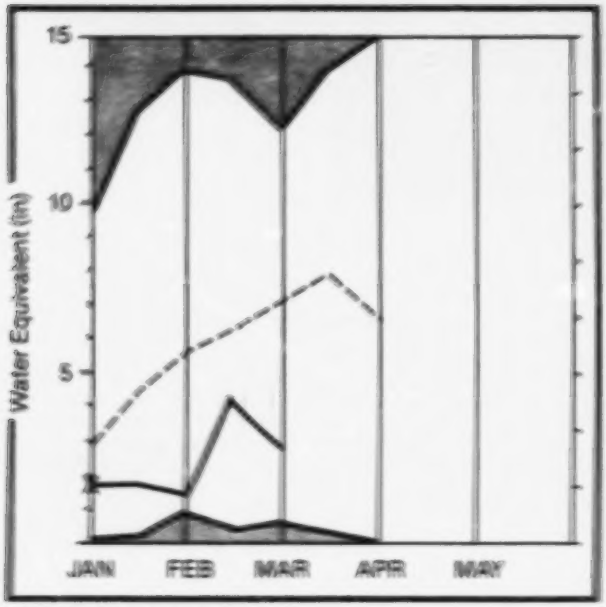
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.#	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
SAN FRANCISCO/GILA RIVERS	7	[illegible]	[illegible]

*Corrected for upstream diversions or changes in reservoir storage.
#Average is for 1961-80 period.

Little Colorado River Basin

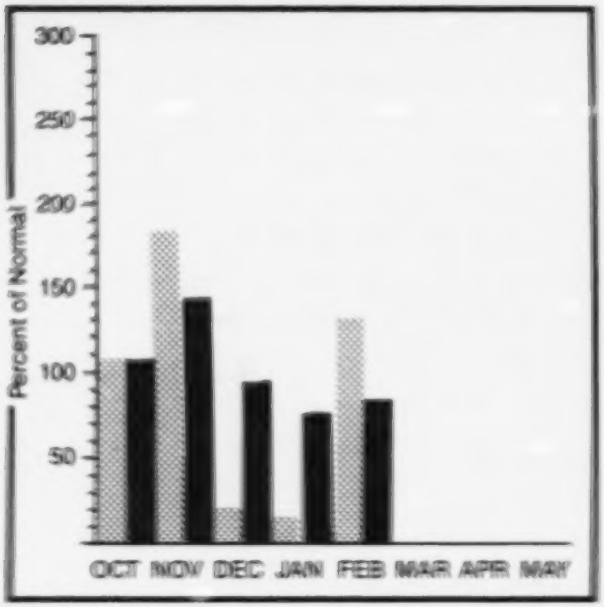
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY

March 1, 1986

OUTLOOK:

Light runoff is forecast for the upper Little Colorado River - 62% of average at Greer and 34% at Lyman Lake. February precipitation was 132% of average over the basin but most of the new snow has melted. The March 1 snowpack was rated at 40% of average with a 90% of average snowpack estimated in the Chuska Mountains. Storage in Lyman Lake was up to 24,400 acre feet and Show Low Lake, 2600 acre feet.

For further information contact your local Soil Conservation Service office.

LITTLE COLORADO RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LITTLE COLORADO RIVER at Greer	MAY-JUN	7.6	4.8	63	179	26				
LITTLE COLORADO RIVER at Lyman Res	MAY-JUN	12.6	4.3	33	148	16				
LITTLE COLORADO RIVER at Woodruff 4	NOV-JUN	17.3	6.0	34	129	12				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	vs USEABLE STORAGE vs THIS YEAR	LAST YEAR	AVE.*
LYMAN RESERVOIR	---	24.4	23.8	---
SHOW LOW LAKE	3.1	2.6	3.1	---

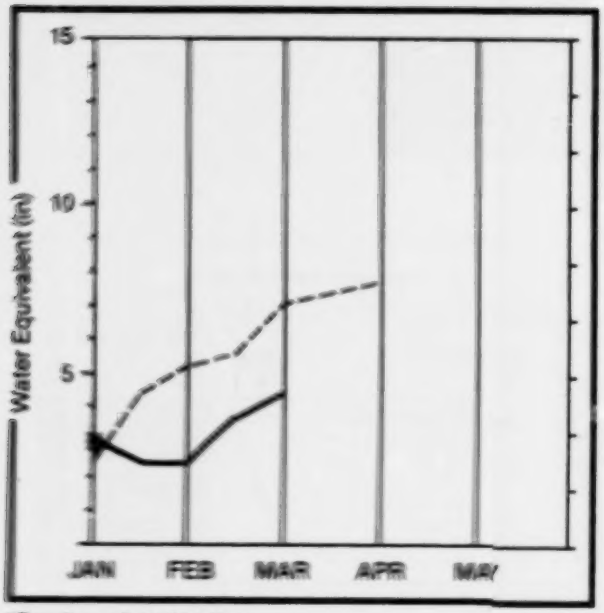
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
LITTLE COLORADO RIVER	5	81	48
CHUSKA MOUNTAINS	5	59	58

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Lower Colorado River Basin

Mountain snowpack* (inches)

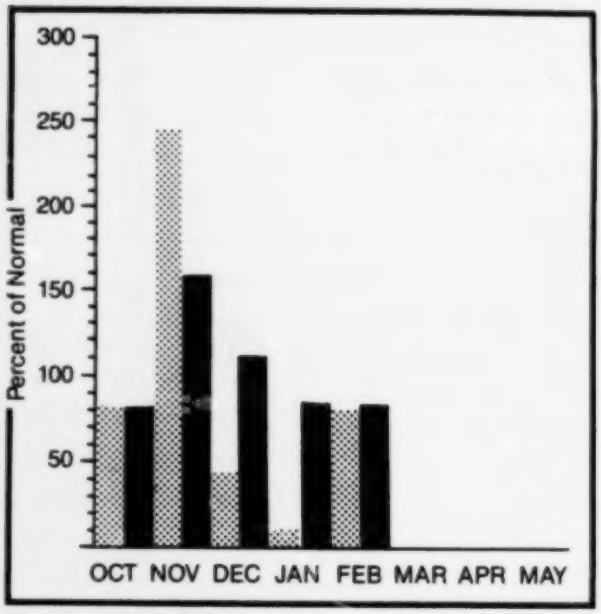


*Based on selected stations

Maximum ——— Average - - - -

Minimum ——— Current ———

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation ▒ Year to date precipitation ■

WATER SUPPLY

March 1, 1986

OUTLOOK:

February storms in the Colorado basin have produced an increase in the forecast of the Colorado River. Inflow to Lake Powell is forecast to be 11,000,000 acre feet from April through July at 147% of average. The April-June forecast for the Virgin River calls for 81% of average flow. Precipitation over northwestern Arizona was 82% of average in February. The March 1 snowpack at the Grand Canyon was 63% of average. A combined storage of 47,924,000 acre feet was reported in the four major Colorado River reservoirs. This is 89% of capacity.

For further information contact your local Soil Conservation [illegible].

LOWER COLORADO RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
VIRGIN RIVER near Littlefield	APR-JUN	62.0	50.0	80	119	53				
INFLOW to LAKE POWELL *	APR-JUL	7462.0	11000.0	147	183	114				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
LAKE HAVASU	619.4	570.7	552.0	539.0
LAKE MOHAVE	1810.0	1581.0	1732.0	1676.0
LAKE MEAD	26159.0	23021.0	23078.0	18377.0
LAKE POWELL	25002.0	21431.0	21348.0	11845.0

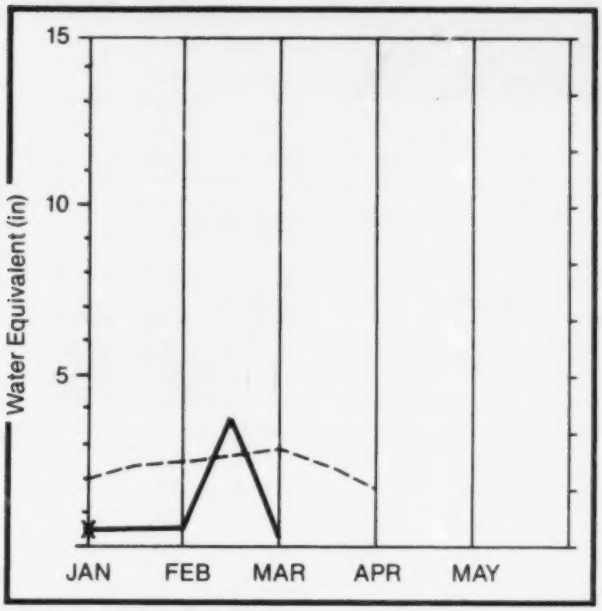
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
LOWER COLORADO RIVER	2	64	62

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Mimbres River Basin

Mountain snowpack* (inches)

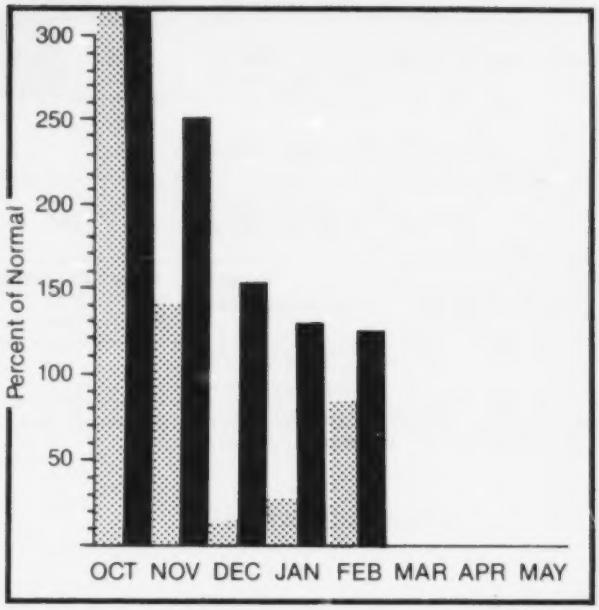


*Based on selected stations

Maximum ———— Average – – – –

Minimum ———— Current ————

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation ▒ Year to date precipitation ■

WATER SUPPLY OUTLOOK:

March 1, 1986

The Mimbres River is only expected to run 43% of average during the March-May period. February precipitation was 86% of average. Very little snow remains in the mountains and the March 1 snowpack was rated at 7% of average.

For further information contact your local Soil Conservation Service office.

MIMBRES RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MIMBRES RIVER near Mimbres	MAR-MAY	3.5	1.0	42	114	29				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
MIMBRES RIVER	3	9	4

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

DATA SITES USED TO DETERMINE SNOW PACK WATER

SALT RIVER

Baldy
Beaverhead
Coronado Trail
Forest Dale Alternate
Hannagan Meadows
Heber
Maverick Fork
Workman Creek

VERDE RIVER

Baker Butte
Baker Butte #2
Chalender
Copper Basin Divide
Fort Valley
Gaddes Canyon
Happy Jack
Mingus Mountain
Morman Mountain
Mormon Mt. Summit #2
White Horse Lake Jct.
Williams Ski Run

GILA/SAN FRANCISCO RIVER

Beaverhead
Coronado Trail
Frisco Divide
Hannagan Meadows
Signal Peak Snotel
Silver Creek Divide
State Line

LITTLE COLORADO RIVER

Baldy
Cheese Spring
Heber
Nutrioso
Promontory Butte

LOWER COLORADO RIVER

Bright Angel
Grand Canyon

SAN FRANCISCO PEAKS

Inner Basin #1
Inner Basin #2
Snow Bowl #1 Alternate
Snow Bowl #2

CHUSKA MOUNTAINS

Bowl Canyon
Tsaile Canyon #1
Tsaile Canyon #2
Wheatfields
Whiskey Creek

MIMBRES RIVER

Emory Pass #2
McKnight Cabin
Signal Peak Snotel

STATIONS USED TO DETERMINE PERCENT OF NORMAL PRECIPITATION

SALT RIVER

Alpine R.S.
Baldy Snotel
Black River Pumps
Buck Spring Snotel
Coronado Trail Snotel
Hannagan Meadows Snotel
Heber Snotel
Maverick Fork Snotel
Pleasant Valley R.S.
Promontory Snotel
Sierra Ancha
Tonto Fish Hatchery
Wildcat Snotel
Workman Creek Snotel

LITTLE COLORADO RIVER

Baldy Snotel
Buck Spring Snotel
Flagstaff
Heber Snotel
Holbrook
Mormon Mountain Snotel
Promontory Snotel
Springerville
Tuba City
Window Rock

LOWER COLORADO RIVER

Bright Angel
Colorado City
Fredonia
Grand Canyon
Kingman
Page
Williams

VERDE RIVER

Ashfork
Baker Butte Snotel
Beaver Creek R.S.
Copper Basin Divide
Flagstaff
Fort Valley
Fry Snotel
Happy Jack
Mingus Mountain
Mormon Mountain Snotel
Payson R.S.
Prescott
Sugar Loaf Snotel
White Horse Lake Snotel

GILA/SAN FRANCISCO RIVER

Alpine R.S.
Beaverhead R.S.
Clifton
Coronado Trail Snotel
Frisco Divide Snotel
Hannagan Meadows Snotel
Lookout Mountain Snotel
Luna R.S.
Reserve R.S.
Safford Exp. Farm
Signal Peak Snotel
Silver City
Silver Creek Divide Snotel
Fort Bayard

MIMBRES RIVER

Mimbres R.S.
Signal Peak Snotel

The Following Organizations Cooperate With The Soil Conservation Service in Snow Survey Work

Federal

Department of Agriculture
- Soil Conservation Service
- Forest Service
  - Apache-Sitgreaves National Forest
  - Coconino National Forest
  - Coronado National Forest
  - Gila National Forest
  - Kaibab National Forest
  - Prescott National Forest
  - Tonto National Forest
  - Rocky Mountain Forest and Range Experiment Station

Department of Commerce
- NOAA, National Weather Service

Department of Interior
- Bureau of Reclamation
  - Region III
- Geological Survey
  - Arizona District
  - New Mexico District
- Bureau of Indian Affairs
  - Navajo Reservation
  - San Carlos Irrigation Project
- National Park Service
  - Grand Canyon National Park
- Gila Water Commissioner
  - Safford, Arizona

State

Arizona Department of Water Resources
Arizona Game and Fish Department
Arizona State Parks Board

Arizona State University
- Laboratory of Climatology
- (State Climatologist)

University of Arizona
- Arizona Agricultural Experiment Station
- Water Resource Research Center
- Department of Watershed Management

Municipal

City of Flagstaff

Irrigation Projects

Salt River Valley Water Users' Association
- Phoenix, Arizona

San Carlos Irrigation and Drainage District
- Coolidge, Arizona

Maricopa County Municipal Water Conservation District
- Peoria, Arizona

Indian Tribes

Navajo Nation
- Window Rock, Arizona

Private

Southwest Forest Industries, Inc.
- Phoenix, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
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PHOENIX, ARIZONA 85012

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

Arizona
Water Supply Outlook

and

Federal-State-Private
Cooperative Snow Surveys

SOIL CONSERVATION SERVICE

986/4

Soil Conservation Service

Arizona Water Supply Outlook

April 1, 1986

A 57.46:

Foreward

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 95802; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Arizona
Water Supply Outlook

and

Federal-State-Private
Cooperative Snow Surveys

Issued by

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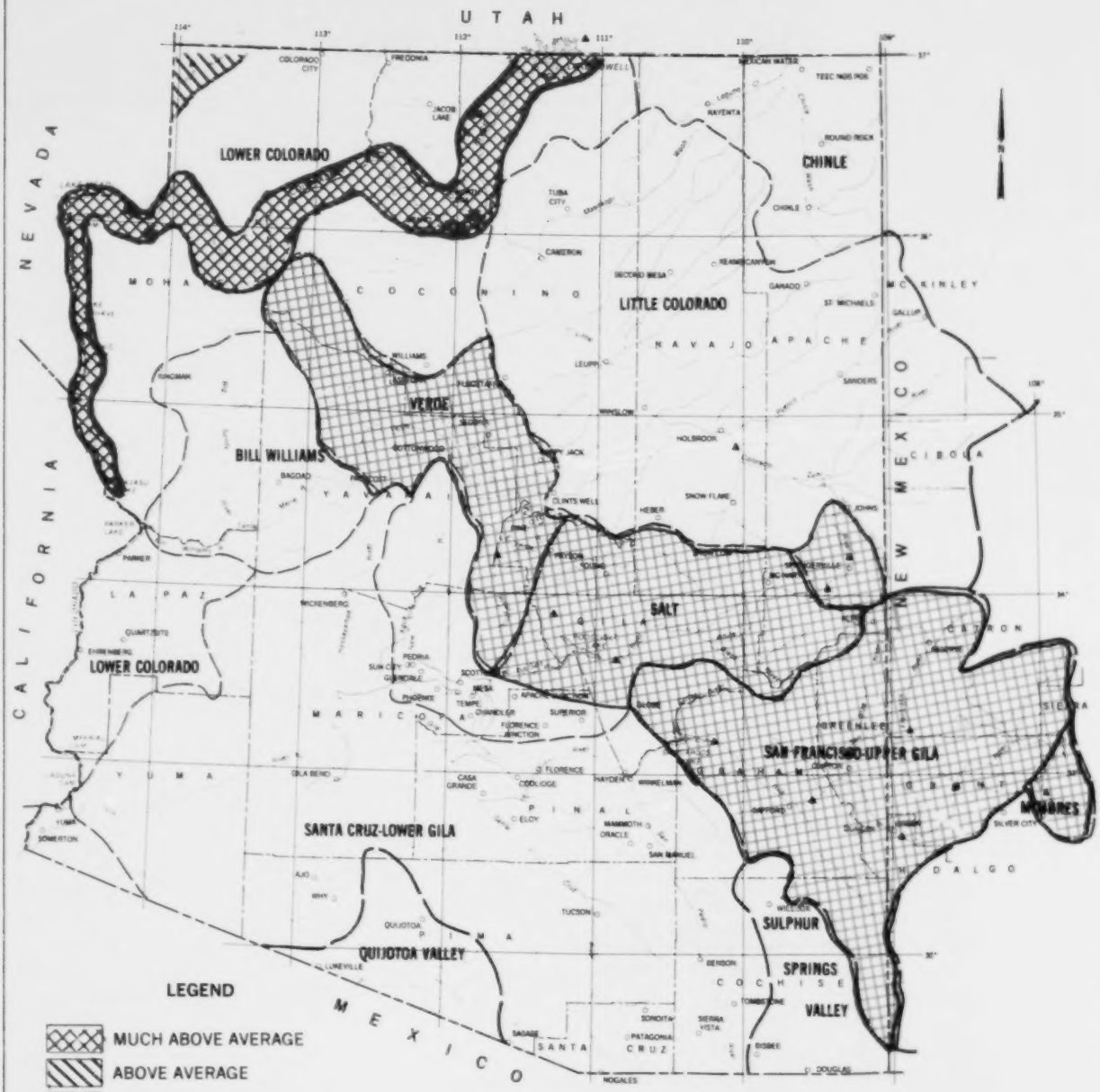
"Programs and assistance of the United States Department of Agriculture are available without regard to race, creed, color, sex, age, or national origin."

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



LEGEND

- MUCH ABOVE AVERAGE
- ABOVE AVERAGE
- NEAR AVERAGE
- BELOW AVERAGE
- MUCH BELOW AVERAGE
- NOT FORECAST
- ▲ FORECAST POINT
- WATERSHED BOUNDARY
- SUB-WATERSHED BOUNDARY

STREAMFLOW PROSPECTS

ARIZONA

0 25 50 75 100 MI

0 50 100 150 KM

SOURCE: Data compiled by SCS Field Personnel.

MARCH 1985 4-R-39105

GENERAL OUTLOOK

SUMMARY: March precipitation and snowmelt produced an increase in streamflow for the month, but the April-May outlook still calls for below average runoff. The April 1 snowpack was much below average and little snow is left except in the San Francisco Peaks, the Chuska Mountains, and the interior parts of the White Mountains. The Salt River is forecast to run 51% of average, Tonto Creek 42% and the Verde River 44%. The San Francisco River should run in the 60% range and the Gila 60%-65%. The Little Colorado is forecast at 68% at Greer and 54% at Lyman Reservoir. Inflow to Lake Powell is forecast to be 144% of average over the April-July period.

SNOWPACK: Much below average snowpack remains on April 1. Snow surveys and telemetry data showed that the snowpack of Arizona and western New Mexico had continued its up and down pattern during March just as it had all winter beginning in late November. Dry conditions in December and January, coupled with periods of warm temperatures depleted the snow from November. Snow received from early and mid February storms melted due to much above average temperatures in late February. Early and mid March storms again built up the mountain snow only to have it melt from another period of warm weather. Only special areas such as the San Francisco Peaks and the Chuska Mountains deviated very much from this pattern.

Snowpack - Percent of Average

Basin	March 1	March 15	April 1
Salt River	34	51	23
Verde River	23	40	29
San Francisco/ Gila River	38	53	25
Little Colorado River	40	37	15
Grand Canyon	63	79	58
Mimbres River	7	73	0
San Francisco Peaks	99	97	106
Chuska Mountains (est.)	90	82	73

PRECIPITATION: Precipitation during March was above average on all forecast basins, ranging from 105% on the lower Colorado River area of northwestern Arizona to 162% on the Mimbres watershed in New Mexico. Most of this precipitation came during the first three weeks of the month with a major storm from March 15 to 18. The general March precipitation and temperature pattern was almost a duplicate of that experienced in February.

RESERVOIRS: April 1 reservoir storage is above average and most large water supply impoundments are nearly full. The Salt River Project system reported 97% of capacity storage with 1,966,000 acre feet. San Carlos was 97% full with 905,000 acre feet. Lake Pleasant held 89,000 acre feet at 57% of capacity. A combined storage of 47,513,000 acre feet was being held in Lakes Powell Mead, Mohave, and Havasu, accounting for 89% of their capacity. Smaller reservoirs increased their storage from March runoff. Lyman Lake reported 27,400 acre feet in storage. Show Low Lake held 3100 acre feet. Watson Lake and Willow Lake each held 4400 acre feet.

STREAMFLOW: Streamflow increased during March in response to a two edged condition remininiscent of February. Rain from the storms of early and mid March produced increased streamflow while snow was building at the higher elevations. When the weather cleared near the 19th, abnormally warm temperatures set in and accelerated snow melt resulted. Streamflow volumes increased further. Many streams produced normal to above normal runoff for the month.

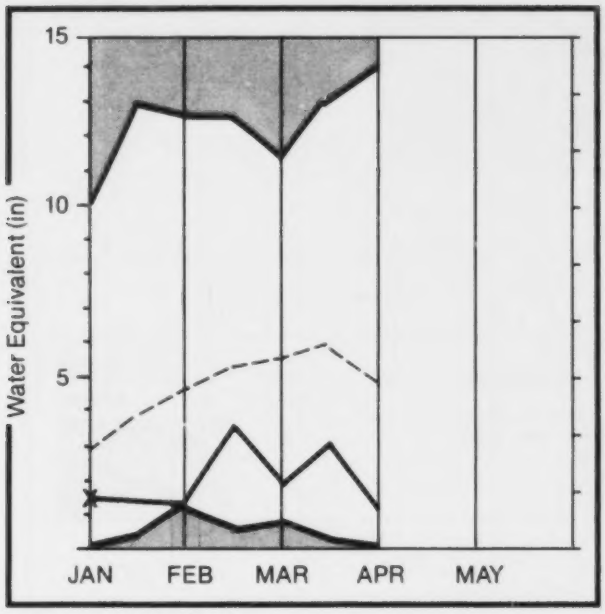
Preliminary Streamflow Observations
March, 1980

Stream	1000's acre feet	Percent of average
Salt River	152.2	121
Verde River	96.5	96
Tonto Creek	44.4	130
Gila River		
Virden	24.8	94
Solomon	41.4	74
Calva	37.8	90
San Fransico River		
Clifton	17.3	69

All streamflow forecasts are coordinated between the Soil Conservation Service and the National Weather Service. All averages and percentages of average are based on the 20 year period 1961-1980.

Salt River Basin

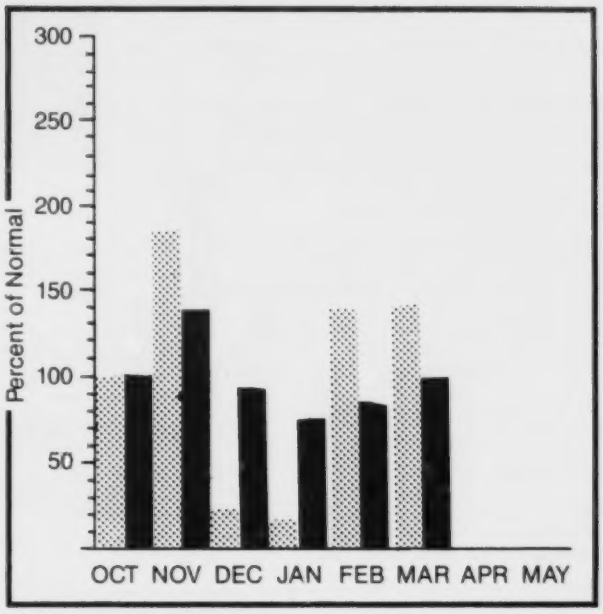
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

April 1, 1986

WATER SUPPLY OUTLOOK:

The Salt River is forecast to produce 51% of average runoff and Tonto Creek, 42% over the April-May period. March precipitation was 140% of average but the April 1 snowpack was only 23% of average. Warm temperatures in late March melted much of the snow. This, coupled with rain runoff, produced above average March streamflow. Salt River Project reservoirs on the Salt River were 99% full on April 1 with 1,687,000 acre feet in storage. Lake Pleasant reported 89,000 acre feet at 57% of capacity.

For further information contact your local Soil Conservation Service office.

SALT RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SALT RIVER near Roosevelt	APR-MAY	204.1	105.0	51	117	21				
	APRIL	130.7	73.0	55						
TONTO CREEK near Roosevelt	APR-MAY	14.2	6.0	42	134	14				
	APRIL	11.2	5.0	45						

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
SALT RIVER RES SYSTEM	1709.0	1407.1	1433.6	1283.0
LAKE PLEASANT	157.6	99.8	122.9	85.0

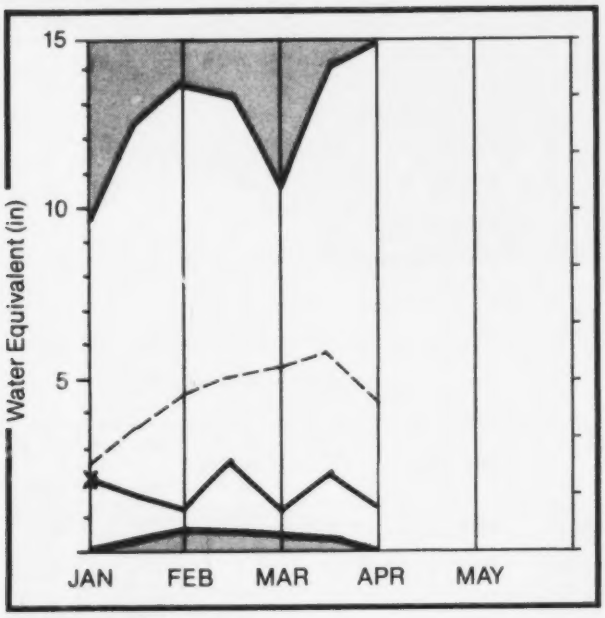
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
SALT RIVER	8	25	22

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Verde River Basin

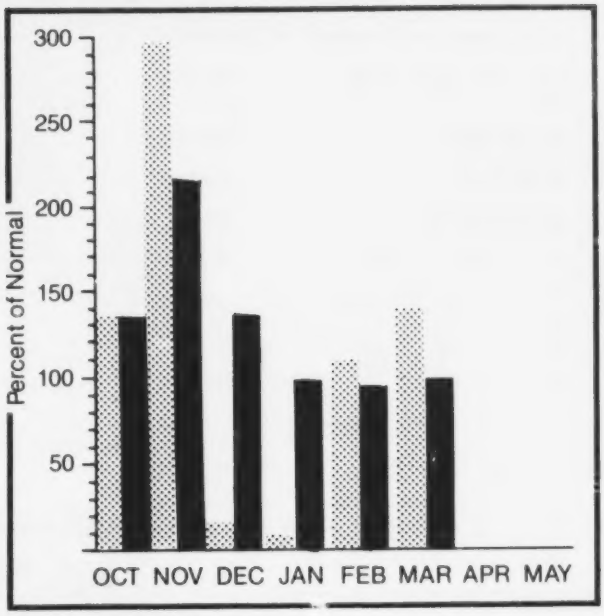
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

April 1, 1986

WATER SUPPLY OUTLOOK:

The April-May forecast on the Verde river calls for 44% of average runoff. Five hundred acre feet or less is expected to enter Lake Mary or flow in Granite or Willow Creek. March precipitation was 139% of average which produced near average runoff on the Verde River for the month. Even though snow was deposited on the basin, most of it melted by late March. The April 1 snowpack was only 29% of average. Because of its higher elevation the San Francisco Peaks snow was still 106% of average. Salt River Project reservoirs on the Verde River had an April 1 storage of 279,000 acre feet at 90% of capacity. Watson and Willow Lakes each held 4400 acre feet.

For further information contact your local Soil Conservation Service office.

VERDE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
VERDE RIVER above Horseshoe	APR-MAY	81.1	36.0	44	171	17				
	APRIL	65.6	26.0	39						
GRANITE CREEK	APR-MAY	---	0.5							
WILLOW CREEK	APR-MAY	---	0.4							
LAKE MARY INFLOW	APR-MAY	---	0.3							

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
VERDE RIVER RES SYSTEM	309.6	278.6	308.6	142.9
WATSON LAKE	4.7	4.4	4.5	3.6
WILLOW CREEK	6.1	4.4	6.1	3.9

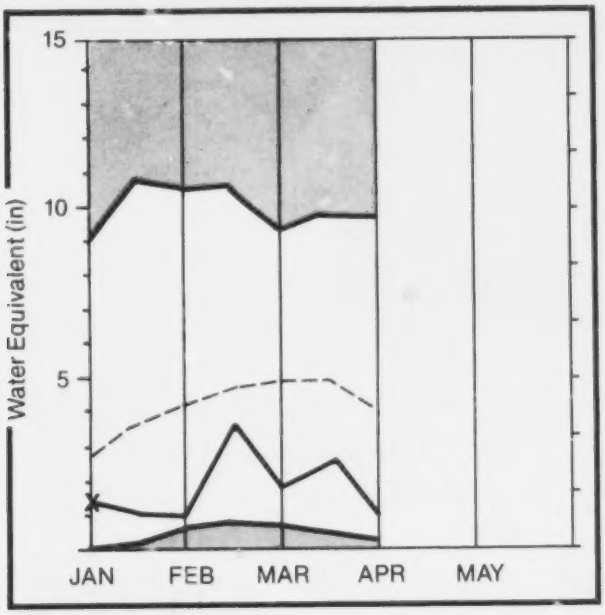
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
VERDE RIVER	10	29	28
SAN FRANCISCO PEAKS	4	75	104

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

San Francisco - Upper Gila River Basin

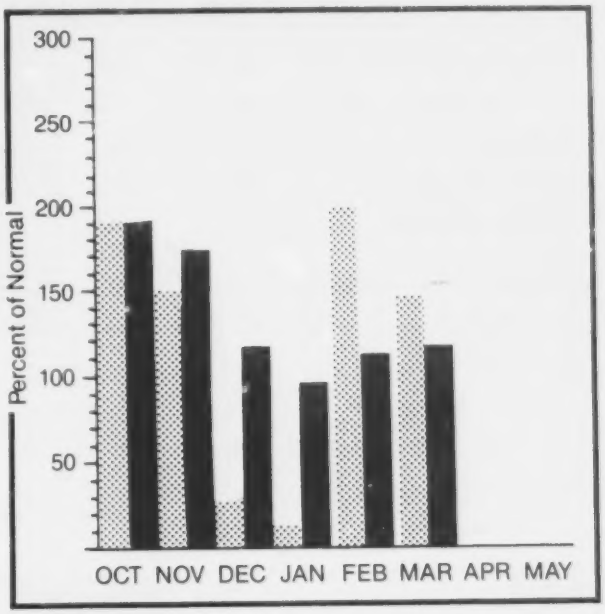
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

April 1, 1986

WATER SUPPLY OUTLOOK:

Below average April-May streamflow is forecast on the Gila basin. The San Francisco River is only expected to produce 61% of average at Clifton. The Gila River is forecast to run 65% at Virden, 59% at Head of Safford Valley, and only 26% at Calva. March precipitation was 146% of average over the basin. Warm temperatures in late March melted much of the snow and the April 1 snowpack was only 25% of average. March runoff was below to near average even with the precipitation and snowmelt. San Carlos reservoir was 97% full on April 1 with 905,000 acre feet in storage.

For further information contact your local Soil Conservation Service office.

SAN FRANCISCO - UPPER GILA RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SAN FRANCISCO RIVER at Glenwood	APR-MAY	15.4	10.0	64	214	26				
SAN FRANCISCO RIVER at Clifton	APR-MAY	31.0	19.0	61	271	26				
GILA RIVER at Gila	APR-MAY	23.7	16.0	67	152	25				
GILA RIVER near Virden	APR-MAY	27.5	18.0	65	167	25				
GILA RIVER near Solomon	APR-MAY	57.0	34.0	59	277	23				
	APRIL	37.3	24.0	64						
GILA RIVER at Calva (unadjusted)	APR-MAY	37.4	10.0	26	237	11				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
SAN CARLOS	935.0	705.4	943.9	329.3
PAINTED ROCK DAM	2492.0	0.0	274.2	---

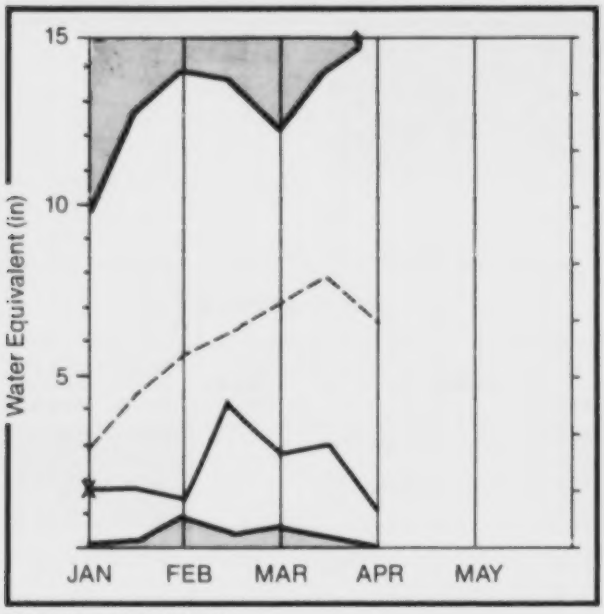
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
SAN FRANCISCO/GILA RIVER	7	34	25

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Little Colorado River Basin

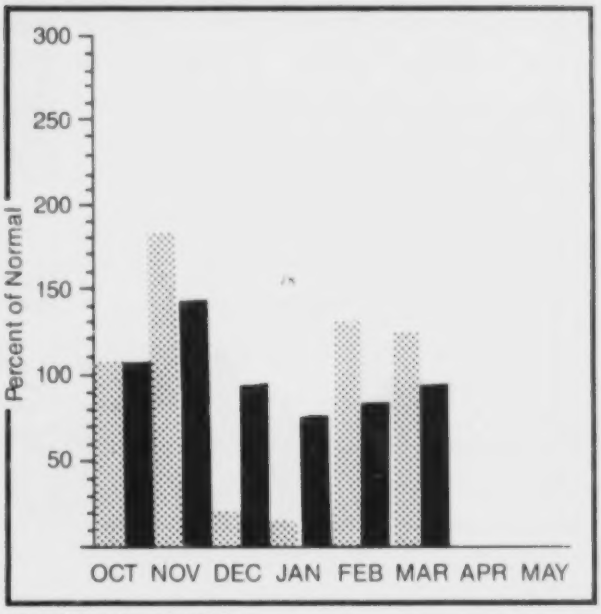
Mountain snowpack* (inches)



*Based on selected stations

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

April 1, 1986

WATER SUPPLY OUTLOOK: April-June runoff on the upper Little Colorado River is forecast to be 68% of average at Greer and 54% at Lyman Reservoir. Precipitation in March was 125% of average. The snowpack built up during March but almost immediately melted. The April 1 snowpack was 15% of average. The Chuska Mountains are estimated to retain a 73% of average snowpack. Lyman Lake held 27,400 acre feet near April 1 and Show Low Lake, 3100 acre feet.

For further information contact your local Soil Conservation Service office.

LITTLE COLORADO RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
LITTLE COLORADO RIVER at Greer	APR-JUN	7.0	4.8	69	143	29				
LITTLE COLORADO RIVER ab Lyman Res	APR-JUN	11.0	6.0	54	127	18				
LITTLE COLORADO RIVER at Woodruff *	NOV-JUN	17.3	6.6	34	104	12				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
LYMAN RESERVOIR	---	27.4	30.8	---
SHOW LOW LAKE	5.1	3.1	5.1	---

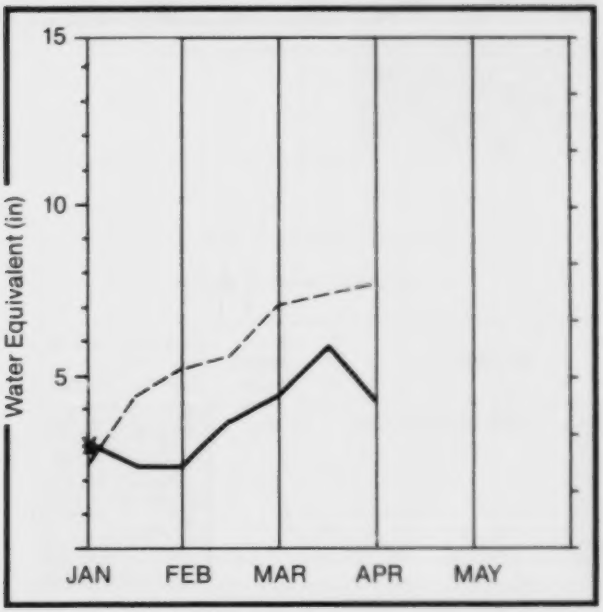
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
LITTLE COLORADO RIVER	5	17	19
CHUSKA MOUNTAINS	5	28	31

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Lower Colorado River Basin

Mountain snowpack* (inches)

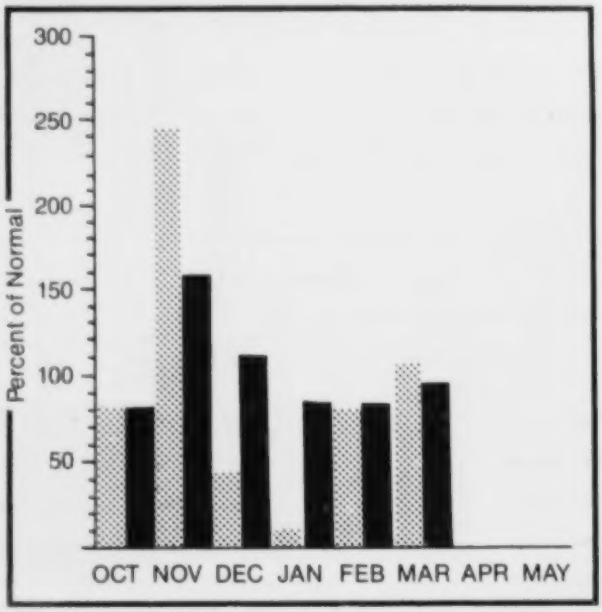


*Based on selected staticns

Maximum _____ Average - - - -

Minimum _____ Current _____

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation ▒ Year to date precipitation ■

April 1, 1986

WATER SUPPLY OUTLOOK: The Colorado River is forecast to produce 10,800,000 acre feet inflow to Lake Powell at 144% of average for April-July. The Virgin River at Littlefield is forecast to run 96% of average over the April-June period. Northwestern Arizona received 105% of average precipitation during March. The April 1 snowpack in the Grand Canyon area was only 58% of average. Reservoir storage on April 1 for Lakes Powell, Mead, Mohave, and Havasu totaled 47,513,000 acre feet at 89% of capacity.

For further information contact your local Soil Conservation Service office.

LOWER COLORADO RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
VIRGIN RIVER near Littlefield	APR-JUN	62.0	[illegible]	[illegible]	[illegible]	[illegible]				
INFLOW to LAKE POWELL *	APR-JUL	7462.0	[illegible]	[illegible]	[illegible]	[illegible]				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
LAKE HAVASU	619.4	[illegible]	[illegible]	[illegible]
LAKE MOHAVE	1810.0	[illegible]	[illegible]	[illegible]
LAKE MEAD	26159.0	[illegible]	[illegible]	[illegible]
LAKE POWELL	25002.0	[illegible]	[illegible]	[illegible]

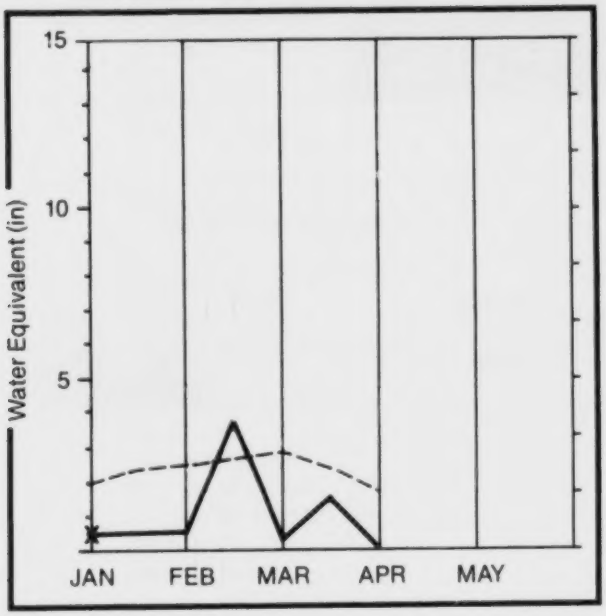
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
LOWER COLORADO RIVER	2	[illegible]	[illegible]

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Mimbres River Basin

Mountain snowpack* (inches)

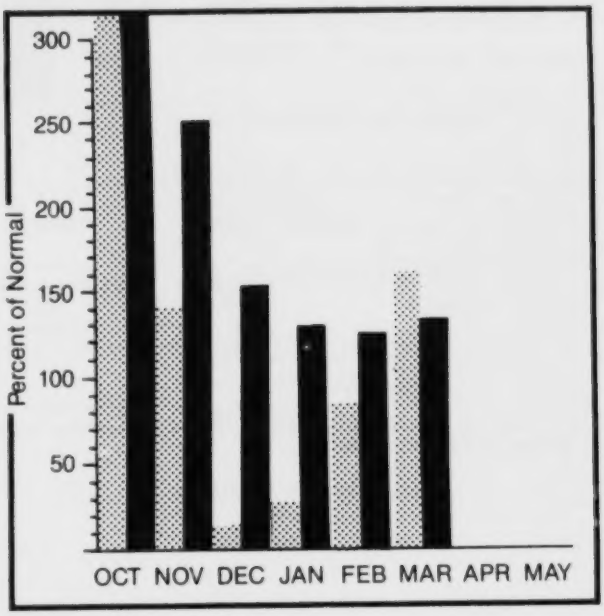


*Based on selected stations

Maximum ———— Average – – – –

Minimum ———— Current ————

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation ▒▒▒ Year to date precipitation ■■■

April 1, 1986

WATER SUPPLY OUTLOOK: Light runoff is expected on the Mimbres River during April-May. The forecast calls for only 500 acre feet or 25% of average. March precipitation was 162% of average but this has already run off. The snowpack on the Mimbres watershed was essentially gone as of April 1.

For further information contact your local Soil Conservation Service office.

MIMBRES RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MIMBRES RIVER near Mimbres	APR-MAY	2.0	0.5	25	150	10				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.

WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
MIMBRES RIVER	3	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

DATA SITES USED TO DETERMINE SNOW PACK WATER

SALT RIVER

Baldy
Beaverhead
Coronado Trail
Forest Dale Alternate
Hannagan Meadows
Heber
Maverick Fork
Workman Creek

VERDE RIVER

Baker Butte
Baker Butte #2
Chalender
Copper Basin Divide
Fort Valley
Gaddes Canyon
Happy Jack
Mingus Mountain
Morman Mountain
Mormon Mt. Summit #2
White Horse Lake Jct.
Williams Ski Run

GILA/SAN FRANCISCO RIVER

Beaverhead
Coronado Trail
Frisco Divide
Hannagan Meadows
Signal Peak Snotel
Silver Creek Divide
State Line

LITTLE COLORADO RIVER

Baldy
Cheese Spring
Heber
Nutrioso
Promontory Butte

LOWER COLORADO RIVER

Bright Angel
Grand Canyon

SAN FRANCISCO PEAKS

Inner Basin #1
Inner Basin #2
Snow Bowl #1 Alternate
Snow Bowl #2

CHUSKA MOUNTAINS

Bowl Canyon
Tsaile Canyon #1
Tsaile Canyon #2
Wheatfields
Whiskey Creek

MIMBRES RIVER

Emory Pass #2
McKnight Cabin
Signal Peak Snotel

STATIONS USED TO DETERMINE PERCENT OF NORMAL PRECIPITATION

SALT RIVER

Alpine R.S.
Baldy Snotel
Black River Pumps
Buck Spring Snotel
Coronado Trail Snotel
Hannagan Meadows Snotel
Heber Snotel
Maverick Fork Snotel
Pleasant Valley R.S.
Promontory Snotel
Sierra Ancha
Tonto Fish Hatchery
Wildcat Snotel
Workman Creek Snotel

LITTLE COLORADO RIVER

Baldy Snotel
Buck Spring Snotel
Flagstaff
Heber Snotel
Holbrook
Mormon Mountain Snotel
Promontory Snotel
Springerville
Tuba City
Window Rock

LOWER COLORADO RIVER

Bright Angel
Colorado City
Fredonia
Grand Canyon
Kingman
Page
Williams

VERDE RIVER

Ashfork
Baker Butte Snotel
Beaver Creek R.S.
Copper Basin Divide
Flagstaff
Fort Valley
Fry Snotel
Happy Jack
Mingus Mountain
Mormon Mountain Snotel
Payson R.S.
Prescott
Sugar Loaf Snotel
White Horse Lake Snotel

GILA/SAN FRANCISCO RIVER

Alpine R.S.
Beaverhead R.S.
Clifton
Coronado Trail Snotel
Frisco Divide Snotel
Hannagan Meadows Snotel
Lookout Mountain Snotel
Luna R.S.
Reserve R.S.
Safford Exp. Farm
Signal Peak Snotel
Silver City
Silver Creek Divide Snotel
Fort Bayard

MIMBRES RIVER

Mimbres R.S.
Signal Peak Snotel

The Following Organizations Cooperate With The Soil Conservation Service in Snow Survey Work

Federal

Department of Agriculture
- Soil Conservation Service
- Forest Service
  - Apache-Sitgreaves National Forest
  - Coconino National Forest
  - Coronado National Forest
  - Gila National Forest
  - Kaibab National Forest
  - Prescott National Forest
  - Tonto National Forest
  - Rocky Mountain Forest and Range Experiment Station

Department of Commerce
- NOAA, National Weather Service

Department of Interior
- Bureau of Reclamation
  - Region III
- Geological Survey
  - Arizona District
  - New Mexico District
- Bureau of Indian Affairs
  - Navajo Reservation
  - San Carlos Irrigation Project
- National Park Service
  - Grand Canyon National Park
- Gila Water Commissioner
  - Safford, Arizona

State

Arizona Department of Water Resources
Arizona Game and Fish Department
Arizona State Parks Board

Arizona State University
- Laboratory of Climatology
- (State Climatologist)

University of Arizona
- Arizona Agricultural Experiment Station
- Water Resource Research Center
- Department of Watershed Management

Municipal

City of Flagstaff

Irrigation Projects

Salt River Valley Water Users' Association
- Phoenix, Arizona

San Carlos Irrigation and Drainage District
- Coolidge, Arizona

Maricopa County Municipal Water Conservation District
- Peoria, Arizona

Indian Tribes

Navajo Nation
- Window Rock, Arizona

Private

Southwest Forest Industries, Inc.
- Phoenix, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

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